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REMARKS ON THE SYRUP AND SOLUTION OF SESQUI-NITRATE
OF IRON.

By JOSEPH LAIDLEY, Richmond, Va.

Solutions and syrups of nitrates of Iron.

A nitric solution intended to be of the *sesqui*-oxide of iron was proposed as a remedial agent, by Mr. Kerr of Scotland, in 1832.*

His formula was modified and a syrup proposed, in 1846, by the late Mr. Augustine Duhamel.†

With a slight variation in Mr. Kerr's formula for the solution, it was introduced into the last edition of the U. S. Pharmacopœia, but the preparations afforded by these formulæ are all liable to one great objection, want of permanence; the cause of which was exhibited, a remedy indicated, and another ferruginous preparation proposed by Professor Procter, in vol. xxiii. pp. 312, 15, of this Journal.‡ As the formulæ there suggested meet the former difficulty, affording preparations that keep unimpaired, for apparently any length of time, it is unnecessary now to dwell longer upon them. My object at present is to call attention to an important fact in reference to the syrup of ternitrate of iron, namely, the formation of *oxalic acid* therein.

Ever since the appearance of Mr. Duhamel's paper, above referred to, "syrup of pernitrato of iron" has been a favorite remedy with many of our practitioners; consequently, it became the duty of the pharmacist to furnish the medicine if possible; but knowing that it would not keep for any length of time, and wishing to supply several inquirers for it with a permanent and efficient syrup of this salt, as soon as Professor Procter's formula for the

* Journal Philada. Coll. Pharmacy, vol. iv. p. 169.

† Am. Jour. Pharmacy, vol. xvii. p. 92.

‡ Several specimens of these preparations now in my possession are fifteen months old, and except a very small deposit in some of the solution of pernitrato of iron, no change whatever is perceptible.

solution was published I prepared some of it strictly in accordance with his directions, making it, however, of double the officinal strength; a portion of this was diluted with an equal volume of distilled water to form the "*liquor ferri nitratis*," and the other portion was converted into a syrup by the following formula:

Take of double strength solution of ter-sesqui-nitrate of iron, 8 fluid ounces,
White sugar, 14 ounces, (Troy.)
Distilled water, a sufficient quantity.

Dissolve the sugar in the ferruginous solution, with the aid of a gentle heat, adding, when cold, sufficient water to make the syrup measure one pint. As thus prepared, it is of a fine reddish brown color, possessing the characteristics of the "solution," and being of the same strength as the Pharmacopœial preparation. To test its stability, several 2 ounce vials were filled with the syrup, securely corked, and placed in situations of dissimilar temperatures; in about a week the cork of one in a warmer situation was expelled; a second soon followed; and one vial, the cork of which was secured with twine, exploded with considerable violence. Similar results attended those in the cool situation, a little longer time elapsing before the action was observable. After standing some time the preparation was again examined, with the following result: it possessed a ferruginous taste, was devoid of astringency, had lost almost entirely the sweet taste, and at the bottom was a light yellow or orange colored precipitate; this was insoluble in water, was washed, and, with the view of determining whether it was an *oxalate*, the following tests were employed, namely:—

- a. The precipitate was dissolved in diluted hydro-chloric acid; the excess of acid neutralized with ammonia water, the addition of which precipitated some of the peroxide of iron, which was separated by filtration, and to the clear liquid was added some
- b. solution of chloride of calcium, occasioning a copious white precipitate, soluble in nitric acid.
- c. To other portions of the liquid (a) were added lime-water, and solution of gypsum, each of which occasioned a white precipitate soluble in nitric acid, showing the probable presence of *oxalic acid*. To confirm it, some of the original precipitate was
- d. dissolved in diluted nitric acid, ammonia water added, filtered &c., as with (a), in which solutions of chloride of calcium pro-



duced a white precipitate; sulphate of copper a blueish white, and nitrate of silver a dense white precipitate, which were all soluble in nitric acid. These experiments prove that the precipitated matter found in the vials was *oxalate* of iron; a result not at all surprising, when we reflect that the solution of *terresqui-nitrate* of iron, as suggested by Prof. Procter, contains, in order to preserve it, a small excess of acid, which in the syrup reacts with the sugar and forms saccharic and oxalic acids, and nitric oxide: the first two unite with the sesqui-oxide of iron, forming saccharate and oxalate of that metal; the nitric oxide being set free occasions the expulsion of the corks and bursting of the vials, already referred to.

Some syrup of the *proto-nitrate* of iron prepared by Prof. Procter's formula at the same time that the preparations of the sesqui-salt were made, continue unaltered and perfectly good up to this time.

The conclusions then to be drawn from these facts are, that the *syrup* of sesqui-nitrate of iron, although in many localities an oft prescribed remedy, is an unscientific and ineligible preparation; for, without an excess of acid, it is a mixture of proto and per nitrate, and with that excess the acid generates oxalic acid. It is a superfluous and unnecessary preparation, for as the simple solution prepared by Prof. Procter's formula keeps perfectly well, there can be nothing gained by adding sugar to the medicine, the dose of which is so small that it cannot sensibly improve the flavor, and as the iron salt is already *per oxidized*; sugar is of no use for preventing what would not occur—the further absorption of oxygen from the atmosphere.

When a syrup of nitrate of iron is wanted, the *proto-nitrate* should be employed; in it there is no excess of acid to act on the sugar, which is employed to prevent peroxidation of the iron, and it is not only permanent but pleasant to the palate.

NOTE ON ADULTERATED POWDERED SOCOTRINE ALOES.

By WILLIAM PROCTER, JR.

Having been recently called upon to examine two specimens of aloes in reference to their purity, it has been thought that a few remarks relative to the result will not be without use.

Specimen A presents the form of masses of a conglomerated powder, of coarse texture, with numerous minute woody-fibres disseminated through it, and visible to the naked eye. When breathed upon, it exhales the odor of true socotrine aloes ; it gives a yellowish-brown slightly greenish colored powder, very gritty under the spatula, and evidently consists of that variety of aloes, admixed with other matter, partly ligneous, and partly inorganic.

Specimen B is a mass and fragments, rendered friable by a thorough dessication, effected with a view to powdering, and readily brakes up when handled. Its color in mass is reddish brown, modified by the fissures on its surface ; possesses the odor of true socotrine aloes, and affords a deep orange yellow powder when recently triturated.

The specimen A is part of a lot of about 1000 pounds sent to a Western druggist from New York, and refused on the ground of its not being of good quality. The druggist in New York asserts that the aloes was pure when sent to be powdered, as a retained sample, which was submitted to an analytical chemist in that city, was pronounced to be of good quality.

The specimen B was a sample of a lot of aloes powdered and sent to the same Western druggist by another party, and which proved satisfactory.

In the following statement relative to the treatment of 100 grains of each specimen, it must be understood that each result was obtained from a separate quantity, and not from the same portion.

Specimen A.

100 grs. contained 42 grains, insoluble in cold water.
 100 " " 33 grs., insoluble in boiling water.
 100 " " 10 grs. apotheme or altered aloecin, deposited
 from the solution in boiling water by cooling.
 100 " yielded 13 grs. of incombustible ash when incinerated
 in a platina crucible.
 33 grs. of residue insoluble in } 12 grs. of incombustible ash by
 boiling water yielded. } incineration.
 100 grains yielded 37 grs. insoluble in alcohol 35° Baumé.

Specimen B.

100 grs. contained 33 grs., insoluble in cold water.
 100 grs. " 20 grs., insoluble in boiling water.
 100 grs. " 12 grs. apotheme or altered aloecin.

100 grs. yielded 6-10ths gr. incombustible ash by incineration.

20 grs. of residue insoluble } $\frac{1}{2}$ gr. of incombustible ash by in-
in boiling water, yielded } cineration.

100 grs. yielded $2\frac{1}{2}$ grs. of matter insoluble in alcohol 35° B.

The residue of A, insoluble in cold water when examined with a lens, exhibited shreds of woody-fibre, shining gritty particles, and dried pulpy matter in fragments.

The residue of B, insoluble in cold water, had a resinous kino-like look, and consisted of 20 parts of resin and 13 of apotheme.

The large percentage of inorganic matter in A, does not belong to fair commercial aloes, and it is difficult to account for such an adulteration in view of the less ready detection of cheap aloes. The uniform manner in which the woody-fibre is distributed through the specimen A, leads to the supposition that some vegetable powder was introduced with a view to prevent the conglomeration of the aloes; and the large residue insoluble in alcohol is additional evidence of the impurity of the specimen A. Whether the original aloes was very inferior, and contained both woody and earthy matter, or whether designedly adulterated, it is, of course, impossible to determine by analysis.

PROXIMATIVE ANALYSIS OF A CONCRETION OF HAIRS FOUND IN THE ESOPHAGUS OF A SLAUGHTERED OX.

By JOHN T. PLUMMER, M. D., Richmond, Indiana.

I do not know that any chemical examination has heretofore been made of the hair balls so often found in the stomachs of ruminant animals. According to Youatt, those that are found in cattle are generally devoid of any distinct central body; but sometimes a bit of straw, wood, stone, iron or shell forms a nucleus. The concretions mostly exist in the first and second stomachs; but hard masses of hairs are sometimes obtained from the half-fluid contents of the fourth stomach. In the paunch, the balls consist in part of food and earthy matter; but in the second stomach, to all appearances, they are composed exclusively of hair. The concretions vary in size, and are found at a very early age of the animal. It is said that a ball "as large as two fists" was found in the rumen (first stomach) of a calf only five weeks old. By the

superstitious, they are called witch-balls; but their origin is sufficiently obvious to the intelligent observer.

The concretion in question, after being dried at a temperature of about 70° for several weeks, weighed but 209 grs. It had no taste nor smell, except a very faint cow-house odor; and apparently consisted altogether of hairs, loosely felted together.

On subjecting it to the action of water at the temperature of 40° only, I obtained a brown liquid, which was neutral to test papers, and produced no precipitate by boiling. Acids caused a precipitate which was immediately dissolved by the excess of the reagent. The brown liquid acidulated by exceedingly dilute HCl yielded a white precipitate to $\text{Cfy} + 2\text{K}$.

These, and other reactions indicated the existence of *Casëin*.

The residue of the concretion was treated with a fresh supply of water at 135° for one or two hours. The filtrate was much paler than that of the first maceration; and yielded the same results, but in a less degree.

The washed residue presented to the eye a mass of yellowish brown hairs, and of light brown, irregular formed concretions of various sizes. The hairs were carefully removed, and a portion of the residue rubbed between the fingers imparted an unctuous or soap-stone feeling. A small quantity stirred in alcohol, readily separated; and when placed under the microscope, appeared to be wholly *epithelial scales*; they burnt like horn, and evolved a similar odor.

Treating the epithelium with alcohol (.810) and evaporating the filtrate, which was of a rich golden yellow, I obtained a watery looking fluid; and separated from it an orange red mushy matter.

The limpid fluid promptly reddened litmus, and evaporated at less than 50° so rapidly as to appear to effervesce. An ethereal filtrate furnished a corresponding result. The scantiness of my material allowed me no opportunity to examine it further, except that it left no grease spot upon paper. I set it down as *Butyric Acid*.

The orange red portion heated beyond 212° , gives out a strong cow-house odor; and evaporates with a smoky vapor, leaving a slight residue. It has no acid reaction, leaves a greasy stain when warmed on paper, and is not saponifiable in a solution of potash, at boiling heat. From the alcoholic solution, bichloride of mercury and diacetate of lead precipitate beautiful white crystalline

plates, which became richly red in a drop of concentrated SO_3 ; thus clearly characterising the presence of *Cholesterin*.

Of the *Yellow Oil* there was not a sufficient quantity to experiment upon satisfactorily. The hair dried weighed 20 grs. Under the microscope the filaments appeared perfect, and the pith of the larger ones distinct. Hence the hair did not undergo the digestive process; indeed I am not aware that any form of keratine is susceptible of digestion.

On drying the epithelium from the alcoholic maceration, at nearly scorching heat of paper, the room was filled with the strong cow-house odor.

Thus we have in the original concretion :

Hair	20 grs.
Epithelium	112 grs.
Casein	} 77 grs.
Butyric Acid	
Cholesterin	
Yellow Oil	

The hair was no doubt licked from the hide of a cow or calf; the epithelium was probably derived from the same source; the yellow oil was, I suspect, extracted from these by the alcohol. Casein is found in the pancreatic juice; but as the ball could not have been regurgitated from the duodenum, and the pancreatic juice is not likely to find its way into the second stomach from which the ruminal pellets are projected into the mouth, the reasonable supposition is that the casein was derived from the vegetable food of the animal or its slops.

As, according to Day, cholesterin has never been found in any vegetables used as food, we must look elsewhere for the origin of this constituent. If we assume that the principal constituents of the ball were obtained from the skin of a very young calf, we need seek no further for the fat in question; for in the *vernix caseosa* I have detected cholesterin in large proportion, as indeed have others before: (Fromherz & Juggert.) There are so many sources of butyric acid, that it is difficult to assign its proper origin in the concretion: gastric juice, perspiration, the spontaneous decomposition of fibrin, butyryn, &c., all furnish it.

In order to confirm the microscopic evidence of the presence of epithelium or of some form of keratine, I treated the minute scales

with SO_3 and NO_3 , and obtained sulpho-proteric acid and xanthoproteic acid, the latter readily forming xanthoproteate of potash with this alkali. From this yellow salt in solution, SO_3 and HCl , as well as other acids, threw down a copious white precipitate, which was soluble in potash.

REMARKS ON THE PREPARATION OF HYDRATED SESQUI-OXIDE OF IRON AS AN ANTIDOTE, AND ON THE DUTY OF THE PHARMACEUTIST IN REGARD TO IT.

By WILLIAM PROCTER, JR.

There are few antidotes to active poisons that have proved more uniformly successful than the hydrated sesqui oxide of iron, for poisoning by arsenious acid. Where it has failed, the ill success can, in most instances, be traced to the delay in obtaining it; to its age, and consequent dehydration, when kept ready prepared; to the excessive quantity of the poison, or to the neglect of a proper preliminary use of emetics to throw off undissolved portions of the poison. From the facility with which arsenious acid can be procured in this and other cities, this poison, from its widely known reputation for virulence, is but too frequently resorted to by the suicide. The slowness with which it dissolves in water, is a circumstance favorable to the success of treatment; and as, when ingested by design, it is merely suspended in some liquid, the sooner emesis is excited the better.

The object of these remarks has reference mainly to recall attention to a few suggestions made some years ago,* which will enable any apothecary who will attend to them, to prepare the antidote in its most eligible form in fifteen or twenty minutes notice; and also to urge, that it is his conscientious duty to be always ready to furnish the antidote, no matter how few may be the calls for it.

The following formula, which is somewhat different from that proposed in 1843, is easily executed, and furnishes a concentrated solution of the ter-sesqui-sulphate of iron of known strength, so that the operator can graduate the precise quantity of oxide by means of his measure glass.

* American Journal of Pharmacy, vol. xiv., p. 35.

Take of (proto) sulphate of iron, (well crystallized,) sixty-four ounces Troy.

Sulphuric acid, seven fluid ounces.

Nitric acid, sp. gr. 138, twelve fluid ounces.

Water, a sufficient quantity.

Reduce the sulphate of iron to moderately fine power in an iron mortar, mix together the acids and five fluid ounces of water, put the mixture in a large porcelain capsule on the sand bath, or other regular source of heat, and add the powdered sulphate, about two ounces at a time, stirring after each addition, till the effervescence ceases, until all has been added, and the elimination of nitrous fumes has ceased. In the absence of a porcelain capsule and sand-bath, the operator may use a gallon glass jar supported in a vessel of boiling water; in either case, the vessel should be large enough to allow for active effervescence, and it is hardly necessary to say that the operation should be performed under a chimney-hood, or in the open air, to avoid the noxious fumes of nitrous acid. The dense solution thus obtained should then be diluted with water until it measures four and a half pints, (wine measure,) and then filtered through thick muslin.

Solution of ter-sulphate of iron thus prepared, has a dark, reddish-brown color in quantity, the specific gravity of 1.587 at 60° F., but little if any odor, a powerful styptic taste, and mixes readily with water, so as to form a solution with more color in proportion to its dilution than the strong liquid. Each fluid ounce of this solution contains a fraction more than 120 grains of sesqui-oxide; each fluid drachm 15 grains, and each minim a quarter of a grain; and as it is equally applicable for preparing the oxide for chemical as for antidotal purposes, this correspondence of weights with measures gives great facility in calculating any precise quantity desired.

It is this solution which I have proposed should be kept by every apothecary as the source of hydrated sesqui oxide of iron. Its strength is such that it requires about an equal measure of commercial solution of ammonia (sp. gr. .940,) to decompose it. The apothecary who is suddenly called upon for the antidote will proceed in the following manner:

Take of Solution of ter-sulphate of iron, half a pint.

“ Solution of ammonia, half pint, (or a sufficient quantity.

“ Water, a sufficient quantity.

Pour the solution of iron into a half gallon jar, add two pints of water, and then add the ammonia, stirring constantly until in slight excess. This is known when, after displacing the air in the jar by blowing, it continues to smell slightly of ammonia. The contents of the jar are then thrown on a piece of strong muslin, previously well moistened, and the liquid, holding in solution sulphate of ammonia, expressed from it as quickly as possible, until the oxide remains in the cloth of a pasty consistence. The cloth is then opened on a dish, water added and incorporated with the oxide by means of a spatula, and then again expressed. If the demand is urgent, the oxide may be sent without further washing, if not urgent, the washing may be repeated twice more. It is then quickly removed by a spatula from the cloth to a quart mortar, and water mixed with it by trituration, until it measures a pint, when it should be poured into a wide-mouthed bottle, corked, and the following label attached, viz :

HYDRATED SESQUI-OXIDE OF IRON.

(*Ferri Oxidum Hydratum U. S. Pharm.*)

Antidote to Arsenic.

This preparation consists of Hydrated Sesqui-oxide of Iron and water, in such proportion that each table spoonful contains *thirty* grains of the dry oxide; and is intended to neutralize the poisonous effect of *Arsenious acid*, or *common white arsenic*, when taken into the stomach. It is well to precede the administration of this antidote by an active emetic of ipecacuanha or of mustard, so that any undissolved arsenic may be thus mechanically removed, if possible. If, however, this has not been done before obtaining the *antidote*, no time should be lost in giving it. The patient should take a table spoonful for a dose every five or ten minutes, but if vomiting should intervene, let a dose be given immediately after each attack, unless otherwise directed by the physician in attendance.

When the poisoning has been caused by *arsenite of potassa*, (Fowler's Mineral Solution,) *soda*, or *ammonia*, or by the salts of *arsenic acid*, after giving the first dose add six table spoonfuls of vinegar to the contents of the bottle, and shake it a few minutes, until the acidity is neutralized, and then give it as above.

When the oxide is intended for other ferruginous preparations, as, for instance, citrate of iron, it should be washed by displacement on a cloth filter, till the washings cease to precipitate chloride of barium. The small amount of sulphate of ammonia remaining in the oxide, when prepared hurriedly as above, is of no account in a case of poisoning.

The detail in the above label is not objectionable, as it will be

often of use even to the experienced physician, not to speak of the very many who have had little if any experience in poisoning cases, and will likewise enable any person of ordinary ability to administer the antidote without loss of time.

And now a word in reference to the obvious *duty* of apothecaries, and their *actual* practice as regards a state of preparation to meet the emergencies requiring this antidote. In this country no law compels the pharmacist to keep *any* preparation; he may be without remedies of the first importance, may decline compounding prescriptions on the score of not having the material, or from any other cause, without any legal risk, and no impelling motive to the contrary exists, except self-interest and a feeling of duty. The *former* of these motives is not always appealed to; it has often happened in my experience that no reward, except moral satisfaction, has followed the trouble and expense attendant on supplying a demand for the antidote; as the sufferers too often belong to the utterly miserable poor, or the messengers come, unprovided with the means of payment, from a great distance, and, in the agitation of the moment, forget the due of the apothecary. In this city it has become a practice with many apothecaries to send applicants for hydrated sesqui-oxide to other stores; I have repeatedly been called on, after the messenger had made a circle of four, five or six stores, and walked a long distance, thus greatly delaying the application of the antidote. When it is so easy to be prepared for these occasions, it is greatly to be desired that every apothecary who has a proper regard for his reputation and duty, will provide the means as above detailed, and be ever ready.

STATISTICS OF THE GERMAN UNIVERSITIES.

[The following statistical information was received from our friend Samuel C. Garrigues, in a letter dated Gottingen, Nov. 1st, 1852. Mr. Garrigues, since graduating in Pharmacy at Philadelphia, has been spending the past two years at the Universities of Berlin and Gottingen.—EDITOR.]

The following statistic review of the attendance at the different German Universities for the summer term, 1852, with particular respect to Medicine and Pharmacy, having lately made its appearance in one of the Pharmaceutical Journals, I take

the liberty of sending to you some extracts from it, hoping that they may be of some interest to you.

It had been the intention of the compiler of these statistics to include the number of students of Chemistry and Physics, but owing to the fact that in only a few of the Universities Chemistry and Physics are included as particular Faculties, whereas in the other Universities these studies are included under the head of the Philosophical Faculty, their number could not be determined.

The Prussian Universities are excluded from this list.

UNIVERSITIES.	Number of Students matriculated.				
	Entire Number.	Medical.	Surgical.	Pharmaceutical.	Students of Chemistry
Freiburg	302	57	—	8	—
Heidelberg	703	88	—	6	—
Tubingen	770	126	?	?	—
Munich	1961	258	1	47	—
Wurzburg	722	283	6	8	—
Erlangen	400	53	1	11	—
Giessen	334	82	—	19	41
Marburg	289	55	14	4	—
Göttingen	677	185	—	33	24
Jena	426	90	—	32	—
Leipzig	821	156	44	19	—
Rostock	92	19	?	?	—
Kiel	145	38	?	?	—
Amount	7633	1489	66	187	

Statistic Review of the attendance at the Prussian Universities for the summer term of 1852.

UNIVERSITIES.	Number of matriculated Students.			Those who attend the lectures but are not matriculated.	
	Entire Number.	Medical.	Pharmaceutical.	Entire.	Pharmacist.
Bonn	984	111	...	28	6
Halle	638	71	...	32	3
Berlin	1409	275	...	762	129
Griefswald	200	84	...	4	?
Breslau	836	99	...	23	?
Königsberg	339	71	...	...	...
Amount	4406	701	...	849	138

By this report you will see that the Prussian Pharmaceutical students are not required to be matriculated, the propriety of which has been questioned by Professors in the German Universities.

From the above statements the following facts can be produced :

	Entire Number.	Medical and pharmaceutical.	Pharmaceutical.
1st. The entire number of matriculated students	12,039	—	—
Number of Medical	—	2200	—
“ of Pharmaceutical	—	187	187
2d. Number of not matriculated	965	—	—
“ not matriculated Pharmacutists	—	138	138
Amount	13,004	2525	325

From the Austrian Universities no report has reached us this fall, for the summer term ; below, however, we give the report for the last winter term of 1851-52.

UNIVERSITIES.	Entire number of matriculated Students.	Matriculated medical, surgical and pharmaceutical.	Not matriculated.
Vienna	2178	1196	791
Prague	1324	339	213
Amount	3502	1535	1004

By this you will perceive that the Medical Faculties contain a large proportion of the matriculated students—namely as 1 : 2. 28.

ON VERATRUM VIRIDE.

By THE EDITOR.

Within the last three years, numerous articles have appeared in some of the Medical Journals, attributing remarkable therapeutic powers to the *Veratrum viride*, or *green hellebore*, of this country, most of them written by Dr. W. C. Norwood of Cokesbury, South Carolina, and published in the Southern Med. and Surg. Journal. Dr. Norwood claims to have developed the therapeutic properties

of this plant, to an extent much greater than previous observers, and advocates his views with a degree of confidence not often exceeded by medical experimenters. *Veratum viride* was known to the aborigines as a powerful medicine, and has been written about and experimented with by able physicians. Dr. Osgood of Rhode Island, in an essay published in the American Journal of the Med. Sciences, and republished at page 202, vol. vii. of the American Journal of Pharmacy, (Oct. 1835,) gives an account of many of its effects on the human system, and remarks more especially on its sedative influence on the heart, and its want of the cathartic power of its congener, *Veratrum Album*, and attributes many of his statements to his preceptor, Dr. Tully, then of Yale College. Dr. Osgood, besides, made some chemical observations, and says, "It is commonly said to contain the proximate active principle *veratrine*, as the seat of its medical properties. This opinion, however, seems to be entirely gratuitous, being drawn from its analogy in its external appearance with the European species, rather than from actual investigation. If we consult analogy in medicinal properties, instead of external appearance, our conclusions will be more rationally founded. This is, indeed, the only analogy that can give much weight to an opinion upon this point; and so far as this goes, is in decided opposition to the hypothesis, that the active principle of this species is the same as of the European, that, as has been before observed, being hydrogogue cathartic; whilst this possesses no cathartic powers." Dr. Osgood then details an endeavor to test the correctness of his conclusions by a chemical analysis. He made a saturated infusion by maceration in boiling water, precipitated by ammonia, washed the precipitate with water, and boiled it in alcohol with animal charcoal, filtered while hot, and evaporated. By this treatment a white pulverulent, inodorous and very acrid substance was obtained, producing a stinging sensation on the tongue. Dr. Osgood states that the substance he obtained was so volatile that when exposed on a filter to dry at a temperature not exceeding 120° Fah., it was nearly all volatilized or lost before he was aware of it, which prevented his further investigation of its properties.

About three years after Dr. Osgood, Mr. H. W. Worthington made a proximate analysis of *Veratrum viride*. (See vol. x. page 89, Amer. Jour. Phar.) He made a cold infusion of the root, precipitated it with

subacetate of lead, separated the excess of lead with sulphuretted hydrogen, evaporated to one half, boiled with an excess of magnesia. The precipitate was collected on a filter, dried, treated with boiling alcohol and animal charcoal, and the filtered alcoholic solution evaporated. The light colored pulverulent residue was nearly insoluble in water, more soluble in ether, and very soluble in alcohol. It melted when heated, and burned without residue. It had a burning acrid taste, acted powerfully as a sternutatory, and formed salts with the acids; none of which were crystallizable but the sulphate, tartrate and oxalate. From these properties, Mr. Worthington infers the identity of this substance with *veratria*.

In the absence of therapeutic experiments or an elementary analysis, the view of Dr. Osgood is strongly probable, that it is *not* *veratria*, but like *colchicia*, a distinct, though analogous principle. Dr. Osgood, after detailing his experiments, observes very properly, that "the general impression of identity in active principle with the European species has greatly interfered with the investigation this plant deserves and would otherwise have received. "This remark is but too true, and so strong is the prejudice in favor of exotic drugs, that some of the most powerful and valuable of our indigenous plant sare neglected by the Profession until forced on their notice by the results obtained by quacks and pretenders. In our opinion the question of the true chemical character of the active principle of *veratrum viride* is well worth the attention of pharmaceutical chemists. It is well known that *sabadilla*, and *veratrum album*, contain each a peculiar alkaloid besides *veratria*, *sabadillia* and *jervia*, a peculiarity likewise noticed in *sanguinaria*, *cinchona*, and *nux vomica*. May not this be true of the American *veratrum*? With these preliminary remarks, we will give an extract from the last of Dr. Norwood's papers on the properties of *Veratrum viride*:—*Southern Med. and Surg. Jour.*, Jan. 1853.

"1st, It is acrid. This property is very limited and confined to the fauces. 2d, It is adanagic, deobstruent, or alterative; this property it possesses in a marked and very high degree, not equalled by calomel or iodine in this particular, which will adapt it to the relief and cure of many diseases hitherto beyond the reach of any remedy. Of this class of diseases, those which we think will be much benefitted by it are cancer and consumption. 3d, It is actively and decidedly expectorant, so much so that we rarely add

any other article. 4th, It is one of the most certain diaphoretics belonging to the *materia medica*; it often excites great coolness or coldness of the surface; in some cases the skin is rendered merely soft and moist; in other instances, the perspiration is free, and at other times it is most abundant; but, notwithstanding its profuseness, it does not reduce or exhaust the system, as many diaphoretics do when in excess, and therefore need not excite alarm, or be suspended on that account. 5th, It is nervine, not narcotic under any circumstances; as since our first article we have taken it more than twenty times, to test its varied powers, and we have taken it in all quantities from the production of free emesis down to the minimum dose. This property renders it of great value in the treatment of painful diseases, and such as are accompanied with convulsions, morbid irritability, and irritative mobility. For example, pneumonia, rheumatism, puerperal fever, convulsions generally, palpitation of the heart, &c. 6th, It is one of the most certain and efficient emetics known, and is peculiarly adapted to meet that indication in whooping cough, asthma, croup, scarlet fever, and in all cases where there is much febrile and inflammatory action. It often excites severe nausea and frequent vomiting; which, taken in connection with great paleness, often alarms the patient and the bystanders; but these effects, when in excess, are readily relieved by one or two full portions of morphine and tincture of ginger, or of laudanum and brandy. One grand and leading feature is, that the exhaustion which follows is not excessive and permanent, but confined merely to the effort. Again, the matter first ejected is a large quantity of thick, slimy mucous, and soon after the liver is called on to pour forth its own fluid in abundance. 7th, The seventh property is its most valuable and interesting, and for which it stands unparalleled and unequalled as a therapeutic agent. So much has been written on what we call the sedative—arterial sedative—properties of this agent, on the power it possesses of controlling and regulating arterial action, that we shall not again run over the amount of evidence on this part of the subject.”

“In small portions, we have found nothing equal to it in exciting and promoting appetite.”

Dr. Norwood recommends the following formula for the tincture:—

“Take of dried root of *Veratrum viride*, eight ounces.

“Alcohol, .835, sixteen ounces.

“Macerate for ten days or two weeks, and express. Medium dose for an adult male, eight drops, to be increased one or two drops every portion, until nausea or vomiting, or a reduction of frequency of the pulse takes place; then reduce to one-half in all cases. Females,

and persons from fourteen to eighteen years of age, should commence with six drops, and increase as above. Children from one to two years of age, to commence with one drop; from two to five years, two drops, and increase one drop. The usual interval with us is three hours between the portions. In ordinary cases of pneumonia we usually continue it three days after the symptoms are subsided. In typhoid fever, and many other diseases, it requires to be continued longer. For the satisfaction and information of the profession, we would state that it may be continued indefinitely, in moderate doses, or short of nausea, without the least inconvenience."—*Southern Med. and Surg. Journ.*, Jan. 1853, page 35.

Dr. Norwood's other papers will be found in the same Journal, for 1850-51-52.

UNITED STATES DISPENSATORY—AN ERROR.

To the Editor of the American Journal of Pharmacy.

DEAR SIR:—A small error, it seems, has managed to find its way into the late (9th) edition of the Dispensatory, and as I have seen no mention of it elsewhere, I avail myself of this means of calling attention to the fact, that pharmacutists and others having copies of this almost indispensable commentary on the American and English Pharmacopœias, may correct the same. It occurs at page 1262 in the formula for *Unguentum Hydrargyri Nitratis* of the U. S. Pharmacopœia; the quantity of nitric acid is *eleven* instead of *fourteen* fluid drachms. Prior to the late revision of our National Codex, eleven fluid drachms of the *then officinal acid*, having the specific gravity 1·5, was used; but at that time the standard acid was changed from the sp. gr. 1·5, to the more natural strength having the sp. gr. 1·42; and of this acid, fourteen measures are about equal in the amount of *real acid* they contain, to eleven measures of the stronger.

Richmond, January 11, 1853.

JOS. LAIDLEY.

ON THE NATURE OF THE OILY SUBSTANCE EXISTING IN COMMERCIAL CHLOROFORM.

By HENRY PEMBERTON.

In order to ascertain whether the use of common whiskey, in the preparation of chloroform, caused the formation of any sub

from concentrated alcohol, that no disadvantage can arise from the use of whiskey in the place of concentrated alcohol, and that if chloroform of absolute purity is required, resort must be had to means of purification subsequent to its manufacture, which is by far easier and cheaper to accomplish than to obtain chemically pure alcohol. By careful rectification the chloroform can be completely freed from every trace of these foreign matters.

In each of the above experiments there remained a small quantity of liquid in the retort, very nearly the same quantity, apparently, from each, but which required so high a temperature for boiling, that the oil bath had to be replaced with the naked flame of a spirit lamp. The distillate now obtained at first resembled the latter portions of that previously distilled, but soon changed its appearance, becoming dark colored, nearly black, and its density increasing to .985, its taste and odor also somewhat different. The distillation was continued until all the liquid had passed over into the receiver and a small quantity of a black residue remained, which was soft, like wax, without taste or odor; burnt like pitch, with a thick smoky flame; soluble in chloroform, but not in water or alcohol.

On examining the nature of the substance spoken of above, I have found that it contains two substances of very different boiling points and densities, but similar chemical properties. The first liquid, when as pure as it could be obtained by re-distillation, is a colorless liquid of a fruity, aromatic odor, somewhat resembling a mixture of acetate and valerianate of amyle, of a pungent ethereal taste, and producing coughing, inflammable, burning like alcohol, with a clear blue flame, of sp. gr. 840, and boiling at about 280° F. The second liquid has in a lesser degree the taste and odor of the above, it is less ethereal and more oily in its taste and appearance. The boiling point could not be determined with any accuracy, as the thermometer rose gradually from 280° to 420°, at which point the vapors condensed in violet streaks in the condenser, forming a brownish liquid, indicating some decomposition of the liquid and separation of carbon. Its density was about .985.

On treating a portion of each of the above separately with bichromate of potassa and oil of vitriol, they were each converted into a mixture of valerianate of oxide of amyl and free valerianic acid, without any perceptible formation of muriatic acid, chlorine,

or other products, thus showing them to belong to the amyl series, and that their formation is probably due to the fusel oil, of which all commercial alcohol contains traces, and which it is difficult to remove completely.

These liquids differ from amylic alcohol by their odor, taste, and boiling points, and also in their re-action with oil of vitriol. Fusel oil, when mixed with sulphuric acid, forms a purple solution so dark as to be opaque. These substances only become light brown and retain their transparency.

Soubeiran and Mialhe have mentioned the existence of the oily substance in chloroform prepared from alcohol, but they have erred in describing it as a chlorinated oil. They speak of it as being heavier than water, and chlorine being found among the products of its combustion. They have evidently experimented with a mixture of the substance in question, with chloroform, which could easily be mistaken for a component part of the compound, as its characteristic smell is entirely masked by the amyl compound, and it is retained with such pertinacity as to require a temperature of 250° to separate them.

It is probable these substances are a mixture of *amylene*, *paramylene*, and *metamylene*, isomeric modifications of a product derived from amylic alcohol, by the subtraction of water, and bearing the same relation to amylic alcohol that olefiant gas does to alcohol. They are thus described by Regnault (Cours. élémentaire de Chimie, 2d edition, tome iv., p. 63.) "Amylene thus obtained is a colorless liquid, very fluid, boiling at 39° C. (102° F.); the density of its vapor is 2.45, and its equivalent $C_{10}H_{10}$, corresponding to four volumes of vapor like that of olefiant gas. Amylene is susceptible of forming two isomeric modifications, *paramylene* $C_{20}H_{20}$, and *metamylene*, of which the formula is $C_{30}H_{30}$, or $C_{40}H_{40}$. These two products are generally formed at the same time with amylene, and are found in the last portions of the distillate, but they can be obtained directly by distilling, several times consecutively, amylene with chloride of zinc. Paramylene boils at about 160° C. (320° F.); the density of its vapor is double that of amylene and has thus determined its formula to be $C_{20}H_{20}$. Metamylene does not distill until about 300° C. (572° F.), but it is probable that it has not yet been obtained in a state of purity."

The coincidence between the substances here described and

those existing in chloroform is sufficient to justify the belief that the oily substances are a mixture of paramylene and metamylenes, with, possibly, traces of amylene, though the greater portion of the latter would probably be lost, from its low boiling point, with the incondensable gases from the still in the preparation of the chloroform. It is not likely that any injurious effects could arise from the presence of these substances, even if a re-distillation to remove them was not resorted to, since their slight volatility would prevent their vapor from being mixed in any perceptible quantity with that of chloroform.

Philadelphia, Feb. 14th, 1853.

ON THE ACTION OF SULPHURETTED HYDROGEN AND SELENIURETTED HYDROGEN UPON CHLOROFORM, IN PRESENCE OF WATER.

By A. LOIR.

Action of Sulphuretted Hydrogen.—If sulphuretted hydrogen is passed into chloroform, under water, there is formed in a short time a copious, white crystalline volatile deposit, of a most unpleasantly strong, garlicky odor. The chloroform disappears completely if the gas is passed into it for a sufficient length of time, and the liquor is strongly agitated. No gas conducting tube becomes often obstructed. The secondary products are formed. If chloroform is placed in a frigorific mixture, and saturated with dry sulphuretted hydrogen, there is formed only an insignificant amount of the crystalline body, and which no doubt is formed on account of the imperfect dryness of the gas and apparatus, but if water is added, immediately the crystalline body shows itself at the usual temperature. The perfectly formed crystals, are four sided, flat, long prisms, whose base is inclined towards its angles.

This body can become very hard and form a solid mass, if the temperature permits it to be pressed for a sufficient length of time. It is very volatile. Exposed to the air it gradually disappears. Placed in a glass vessel it sublimes towards the upper part of the vessel, the crystals group themselves into beautiful ramifications, and change their places by every variation of temperature. Its taste is lively, garlicky, then burning, resembling chloroform. It

is heavier than water, and does not alter test paper. It melts with the warmth of the hand and solidifies again below zero (32° F.); it burns more readily than chloroform; it decomposes easily if attempted to be dried. I have found great difficulty in obtaining it identical in different operations; since it can only be freed from adhering water by pressure, it therefore always contains more or less thereof. Consequently I have not been able to determine correctly its formula, in particular the number of equivalents of water, which have united with chloroform and sulphuretted hydrogen.

The analysis shows that the chloroform and sulphuretted hydrogen have united in equal equivalents in this combination.

Seleniuretted Hydrogen.—The preparation of the above compound with seleniuretted hydrogen, is the same as that of the preceding body; its properties are analogous.

Its formation, appearance, and reaction, show this body to possess the same composition as the preceding compound. From want of material I was unable to carry out its analysis.—*Jour. für Pract. Chemie*, from *Compt. Rend.* xxxiv. 14—547.

ON PIPERIDINE. A NEW ALKALOID.

By M. CAHOURS.

In a paper published in the 70th vol. of the *Ann. der Chemie und Pharmacie*, MM. Rochleder and Wertheim announced that on submitting to distillation a mixture of Piperine and caustic soda, a volatile oily base is obtained, possessing all the properties of picoline.

Wishing to make a very deep research into the nature of this base and its isomeric aniline, M. Cahours distilled, according to the directions of the above-mentioned chemists, one part of pure piperine with from $2\frac{1}{2}$ to 3 parts of caustic potash. The products of this distillation, collected in a cooled receiver, was found to be composed of water, two distinct volatile bases, and a trace of a neutral substance possessing an agreeable aromatic odor, recalling that of the derivatives of the benzoic series.

On treating the crude product with fragments of caustic potash, a light oily matter, soluble in all proportions of water,

was separated, and which, submitted to distillation, was almost entirely disengaged between 105° and 101° C. Towards the end of the operation, the thermometer rose rapidly to 210° C., and remained stationary at that point. The most volatile portions, forming more than nine-tenths of the crude material, being submitted to a second rectification, distilled at a temperature of 106° C. It is a colorless liquid, possessing a strong ammonia-cal odor, at the same time resembling that of pepper; it restores the blue color of reddened litmus paper, has a very caustic taste, and saturates the most powerful acids. It dissolves in all proportions of water, to which it communicates very distinct alkaline properties; the solution acts in a manner analogous to that of ammonia with respect to saline solutions; it does not, however, appear to re-dissolve the oxides of copper and zinc.

This base forms perfectly crystallized compounds with hydrochloric, hydrobromic, hydriodic, sulphuric, nitric and oxalic acids. The hydrochlorate yields with chloride of gold a crystalline powder, formed of small needles of a golden yellow color; and with the bichloride of platinum, a compound which crystallizes in long needles of an orange color. Several analyses of this substance made by M. Cahours, furnish exactly the same results; the numbers correspond to the formula $C^{10}H^{11}N$, which has been verified as well by the analyses of its salts and some of its derivatives, as by the density of its vapor; the preceding formula representing four volumes. M. Cahours proposes to give this new alkali the name of piperidine.—*Annals of Pharm.*, May 1852.

ON THE MANUFACTURE OF RESIN OIL FROM ROSIN.

[The following account of "Resin oil," and its products, is extracted from an article in the (London) *Pharmaceutical Journal* for January, 1853, and will throw some light on the nature of similar products made in this country.—EDITOR.]

The resin, from the distillation of which the resin oil, or as it is most frequently called the pine oil is obtained, is the black kind, called also colophony, and it would appear that the discovery of this oil originated from the circumstance that a work-

man employed in a turpentine distillery committed the oversight of carrying the distillation of the rough turpentine beyond the point at which the oil of turpentine had passed over, the consequence of which was, that the resin itself was decomposed by the heat, and resin oil produced. Large quantities of this oil are manufactured in the neighborhoods of London, Liverpool, Hull, Bristol, Glasgow, &c. For this purpose, cast-iron stills of moderate dimensions, with copper worms attached, are usually employed; the first products of distillation being water, acid, and naphtha, after which, on the application of an increased temperature, the resin or pine oil passes over, the first portions of which are kept for mixing with other oils, whilst the latter and heavier oil is employed in the manufacture of grease for lubricating the bearings of heavy machinery, and the axles of railway waggons. &c. &c.

A good deal of secrecy was at one time maintained respecting the manufacture of this oil, and not a few unscientific persons paid dearly for their acquaintance with some who had obtained a knowledge of the manufacture.

The best method of manufacturing resin oil is by the lately patented process of Mr. Furck, in which the distillation is effected by the joint operation of heat obtained from an open fireplace, applied to the exterior of the still, and steam-heat applied to the interior. For this purpose, an iron still of a suitable capacity is employed, provided with a head and curved neck, communicating with a copper worm by means of a moveable joint of pipe placed between them. To the upper part of one side of the still is a man-hole, for introducing the resin, and removing any pitchy deposit from the still; to the lower part of the still an exit pipe of ample dimensions is connected, through which as much as possible of the residuum of the distillation is conducted off at the close of the operation. On the opposite side to that of the man-hole are two entrances or close joints, through which steam pipes pass into the still, one of these being conducted down the inner side and along the bottom of the still to near the centre, where it is curved into a circular form around it, whilst the other, entering the still close above the former, terminates in a perforated coil in the upper part of the still. The annular terminating portion of the steam pipe surrounding the bottom of the still is perforated with

small holes for the escape of the steam during the time the steam is used in the distilling process. A spiral or any other form may be given to the perforated terminating portion of the steam-pipe. As the careful conducting of the operation depends on the due regulation of the heat employed, a thermometer is inserted into the still in the usual way, so as to indicate the temperature of the contents of the interior.

In conducting the process of distillation, a sufficient quantity of resin is put into the still to fill nearly two-thirds of its interior space; the fire is then lighted under the still, and a sufficient quantity of steam is also blown in to moisten the resin; the moveable connecting pipe placed between the neck of the still and the worm, being detached before the fire is made. During the early stages of raising the temperature of the resin, during which the acid and water are driven off, a considerable agitation and frothing up occurs, during which the resin is liable to overflow, and if allowed to pass into the worm, would choke it up, and impede future operations; it is therefore better to drive off the acid and water to waste in the way above mentioned. The acid will begin to escape when the thermometer indicates the temperature of the resin to be 325° Fahr., at which point the fire must be carefully regulated, and the temperature maintained from 300° to 325° , until all the acid has ceased to flow from the neck of the still. The connecting pipe is then attached to the neck of the still and the worm, and the joints well luted. Steam is now blown in through the pipe into the bottom of the still, the temperature being kept at about the point before mentioned. As the steam rises through the melted resin, it takes up and carries the naphtha with it, in the form of vapor, the mingled vapors passing off into the worm, where they are condensed, and the product collected in a suitable receiver. This operation is continued until the naphtha ceases to come over, which is indicated by the appearance of the product, or when about 15 per cent. of the bulk of the contents of the still has been distilled.

As soon as the naphtha has ceased to flow from the worm of the still, the fire is increased until the contents of the still are raised to 500° ; the steam all the while being allowed to flow in, and kept flowing in during the remainder of the process. The oil commences to rise with the steam when the heat is raised to 550° ,

the mingled vapors passing into and being condensed in the worm, from whence they are discharged into a suitable receiving vessel. The temperature of 550° must be kept up until the flow of oil nearly or quite ceases. The bulk of oil should be about twenty-five per cent. of the original quantity of resin.

The contents of the still are then raised to 600° , when the flow of oil and moist vapor recommences, and continues until a second quantity of oil, equal to about twenty-five per cent. of the resin, is discharged, when the flow of oil will nearly cease. The temperature of the still is then raised 50° higher, when the flow of moisture and oil again commences, and continues under the same heat until a third quantity of oil is discharged, equal to about $12\frac{1}{2}$ per cent. of the bulk of the resin originally placed in the still, after which the fire is extinguished. The residue left in the still is of a nature like pitch; this is drawn off through the discharge pipe. During the process steam is injected into the upper pipe upon the oil whilst it is in a state of vapor, thus producing a purifying influence upon the oil.

An oil suitable for employment as a *paint oil*, is prepared, according to Mr. Furck's process, by first placing in the still some of the oil obtained at a temperature of 650° , as before described, and the man-hole of the still having been closed and luted, the contents are then raised to 650° , and kept at that point until the process is completed. At this temperature the oil passes over as vapour, when steam is injected into the still through the upper steam pipe before referred to. The oil thus obtained is condensed in its passage through the worm, and having been received in suitable vessels, is next re-distilled in the same way, after which it is placed in a kind of kettle or pot, in which its temperature is raised to about 225° , by means of steam blown in through an open pipe dipping to near the bottom of the vessel; and having attained that point, steam is let in through another pipe, the end of which is enlarged and perforated by numerous small apertures, until the oil is freed from all acid and coloring matter, when it will be quite clear, and fit to be boiled like linseed oil for painter's purposes.

To obtain an oil fit for the uses of *tanners and curriers*, some of the oil obtained at 650° , as before described, is placed in the still, and about five per cent. of slaked lime added; the man-hole of the

still is then closed and luted, and the contents raised to 600° , and maintained at this point until the process is completed. The steam is introduced through the lower steam pipe when the temperature has reached 300° , and through the upper steam-pipe when it has attained to 600° . The oil passes off in vapor to the worm, where it is condensed and collected, after which it is re-distilled in the same manner, caustic lime being substituted for the slaked lime used in the previous process. The oil thus obtained is placed in the purifying vessel before mentioned, and its temperature raised as in the process for producing painters' oil. This oil is stated to be clear and pure, entirely free from acid, and forming an excellent carriers' oil.

A *lubricating oil* for the uses of machinery, &c., is obtained by first placing the oil produced at 550° in the still, with about five per cent. of its weight of slaked lime; the man-hole is closed and luted, and the temperature raised to, and sustained at about 550° , until the process is completed. The steam is let on as described in making tanners' oil; and the oil having been condensed, is re-distilled and treated in exactly the same way as tanners' oil, after which it is run into the purifying vessel, and treated as before described. It is thus obtained pure and limpid.

Resin oil is also obtained in the process for manufacturing gas from resin; and in a patent granted to Mr. Robertson in 1848, a claim is made for the manufacture of a spirit (ethereal oil) from resin oil thus obtained. This is the same as the naphtha mentioned above, which is directed to be purified by re-distillation once, twice, or oftener, in combination with a small quantity of lime, until it attains the required freedom from color, three-quarters of an ounce of lime being used to each pound of spirit.

In France, M. Dives patented in 1828 a process for making a drying oil with resin oil, and in 1838, MM. Payen and Huran patented a process for the manufacture of a lubricating grease by combining lime, potash, or soda, more particularly the former, with resin oil. MM. Fremy and Boutin undertook a series of investigations with regard to the removal of the pyrogenous odor which accompanies resin oil, with the view of rendering this oil fit for the manufacture of soap. In this, however, they were unsuccessful, and we are not aware of any successful attempts to remove the odor which so tenaciously adheres to this oil. M.

Fremy has paid much attention to an investigation of the chemical nature and properties of resin oil and the other products obtained in its investigation.

M. Serbat, of St. Saubre, near Valenciennes, has also paid much attention, in a commercial point of view, to the manufacture of this oil, and particularly of grease for machinery, the process for which was patented in France in 1846. In 1848, the Paris Society for the Encouragement of the Arts, &c., presided over by M. Dumas, made a report on this grease, from which we extract the following :

"The resin known under the name of *black resin* is submitted to distillation in suitable apparatus, and the *first* products of the distillation are separated. These products consist of oil, part of which is put aside to be employed in painting, and the remainder is used for making grease.

- | | | | |
|--------------------------------|---|---|------------|
| 1. Essential oil for painting, | - | - | 26 kilog. |
| 2. Oil for grease making, | - | - | 431 kilog. |

"The oil obtained by this distillation is purified in the following manner: All the oil intended for making grease which comes from the still, is poured into a copper boiler; it is heated to the boiling point, and allowed to boil for two hours. To the oil is added either fragments of zinc or of slaked lime, in the following proportions:—oil, 97; zinc, 1; or lime, 1.

"The object of the addition of these agents, is : 1st, to separate the acids which may exist in the resin, or may be formed during the operation. 2ndly, to deprive the oil of the water which has passed off during the distillation, and which volatilizes during the boiling. The oil thus boiled is drawn off hot, and left at rest in copper reservoirs, for a longer or shorter period, but in six hours afterwards it may be employed either in the preparation of lime-paste or of grease. Usually the oil is divided into two portions, one for making the lime-paste, and the other for conversion into grease by the use of the lime-paste.

"The reservoir for the oil must be furnished with two taps; one above to draw off the oil, and the other below to separate the dregs. These dregs are not lost; the oil contained in them is separated by water and heat.

Preparation of the Lime Paste.

Take of slaked lime	-	-	36 kilog.
" oil	-	-	52 kilog.

"Heat the oil, and when moderately hot add a portion of the slaked lime, which must be incorporated by stirring with an iron spatula, pierced with holes in the upper part. When a portion of the lime is incorporated, add more, by degrees, until the mixture is complete.

"The oil must be only moderately heated, for if heated too much, and much lime be added, there will be danger of frothing up and boiling over the vessel. The boiler in which the operation is performed must be heated only at the bottom. It must be of cast-iron; the operation takes about twelve hours. It is complete when the mixture is become liquid, and of a chocolate color. Seen in the dark this mixture is phosphorescent.

"This lime-paste, when cold, may be used for making grease; it retains its properties for an indefinite time."

Manufacture of the Grease.

The lime-paste being prepared, it must be kept warm: and then proceed as follows:

"Take 10 kilog. of oil, pour it into a small boiler furnished with a lip, and pour into it (violently shaking it) 1 kilog. of the liquid lime-paste. Then pour the mixture, when well shaken, either into boxes or casks; it solidifies with extreme rapidity, and before it is cool."

One can scarcely believe that it can be the addition of lime which solidifies the oil, as the lime-paste is in a liquid state; there is, no doubt, a particular combination formed. The grease, thus solidified, melts when again heated, but does not again solidify. The advantages of grease made in this manner are as follows:— It is quickly prepared; its quality is uniform; it does not soil or daub the machines; it is not shiny; and does not increase the friction.

Resin oil is much used in France in the manufacture of printing ink; hence, we believe, one source of the unpleasant odor derived from some of the French newspapers. Mr. Pratt, of New York, patented the application of resin oil in place of linseed and other oils in the manufacture of printing ink in 1848. For this purpose one pound of resin oil, thirteen ounces of resin, and three ounces of yellow soap are well mixed together by the application of heat and continued stirring, the proportion of soap and resin being in-

creased when the ink is required to be more stiff, and decreased when it is required to be more fluid. Pigments, or coloring matters of any kind, are to be added, as in other cases.—*London Pharm. Journ.*

THE COMPOUNDS OF IODINE WITH QUININE AND MORPHINE.

By F. W. WINCKLER.

Iodide of Quinine.—When iodide of potassium and sulphate of quinine are dissolved in boiling water, in equivalent proportions, regular crystals (free from iodine) of sulphate of quinine are formed. A similar result is obtained when, instead of sulphate of quinine any other salt of quinine formed with an oxy-acid is used. The hydro-acids give a contrary result. A mixture of hydrochlorate of quinine and iodide of potassium, in equivalent proportions, precipitates a small quantity of iodide of quinine in a resinous state. For the complete decomposition of the hydrochlorate of quinine, Winckler has found that four equivalents of iodide of potassium are necessary. The compound then produced consists of two equivalents of quinine, with one equivalent of iodine, or 126 parts of iodine and 328 parts of quinine. This combination has, when dried, the properties of a resin. When cold, after being thoroughly dried, it is easily powdered without being electric, as the pure quinine is when rubbed. It is white, without smell, permanent in the air, and possesses a very bitter taste. It dissolves considerably in water, almost in any quantity of spirit, and also in ether. All these solutions are clear, colorless, and leave behind, when evaporated, the iodide of quinine in the form of a transparent resin. By chlorine, concentrated sulphuric and nitric acids, this salt is immediately decomposed, with the separation of its iodine. Its combustion on platina foil is with difficulty effected, and the residuum, after combustion, contains no trace of potash. The analysis of this salt gave—

		Found.		Calculated.
Quinine,	- -	71,58	- -	72,166
Iodine,	- -	28,42	- -	27,834
		<hr/>		<hr/>
		100,00		100,000

Iodide of Morphine.—This salt consists of one equivalent of morphine and one of iodine. It is to be obtained by dissolving

120 parts by weight of dry acetate of morphine in 960 parts of cold distilled water, and filtering the solution. Add previously to filtration a few drops of acetic acid, if any of the morphine remains undissolved. Decompose the filtered solution with a solution containing sixty parts of iodide of potassium. The iodide of morphine crystallizes out of this liquid after some time in very fine crystals, and may be obtained in still finer crystals if the mixed solutions are warmed in a water-bath, and then slowly cooled. It thus separates in transparent, shining, colorless, four-sided prisms, which cannot be distinguished by their appearance from sulphate of quinine. Iodide of morphine dissolves slightly in cold water, but readily in hot water, and easily in alcohol. Its solutions have a bitter taste. The analysis of this salt gave—

	Found.		Calculated.
Morphine, -	71,4	- - -	71,24
Iodine, - -	28,6	- - -	28,76
	<hr/> 100,00		<hr/> 100,00

—*Annals of Pharm., and Jahrbuch fur Prakt. Pharm.*

VESICATING OIL.

By E. DUPUY.

The solubility of cantharidin in chloroform, as shown by the experiments of Professor W. Procter, suggested to me the idea of using that vehicle in combination with a fixed oil to obtain a vesicating agent, freed from the disagreeable concomitants of the ordinary fly blister, and retaining the cantharidin in a soluble state. I proceeded thus:

Powdered Cantharides, one part.

Chloroform, } of each (by weight) one and a half parts.
Castor Oil, }

To the powder was added the mixture of chloroform and oil in a close vessel; the ingredients were transferred, after some hours, to a glass apparatus, and the liquid displaced in the usual way. It amounted to about two-thirds of the original bulk of the liquid employed. A few drops of the vesicating oil applied to the arm of an adult produced a perfect blister in eight hours. Its easy application on any given surface may be of value as a vesicatory or epispastic. I would suggest the use of oiled silk over the appli-

cation of it to the skin; by retaining the moisture of the skin it will favor the action of the oil.

THE BEST MEANS TO PRESERVE LEECHES HEALTHY.

By GUSTAVUS SCHÜLLER.

The apothecaries in Moldavia are, according to the sanitary laws, compelled to keep constantly a stock of at least 300 healthy and serviceable leeches. But, particularly as the hot summer months are the most prejudicial season for these animals, it often happens that in the time of the greatest need no leeches are to be obtained.

Amongst the various means which have been recommended to keep leeches healthy, and to restore the sick ones, good well-burnt wood charcoal has proved, according to my experience, to be the best, as shown by the following experiment. I washed the charcoal well three or four times with fresh spring water, to separate the adhering ashes, and then laid it, while wet, and without breaking it smaller, in a large glass cylinder; put the sick leeches, recently washed, into this cylinder, but did not give them any more water, as enough was to be found in the washed charcoal. The glass was tied over with a piece of linen and placed in a cellar, where for five days the leeches were resigned to their fate.

After this period I found the leeches, to my satisfaction, perfectly well. They were quite in a condition to be used, which was not the case in their sick condition.

For two years I have treated my leeches in this way, and always retained them healthy and serviceable. The number of deaths amongst them has been very small. The only precaution I observe is to place all my leeches for eight days in summer on recently washed charcoal, and for two weeks in winter. The method is a cheap one, and one easy of execution.—*Buchner's Repertorium, from Annals of Pharm., for Aug. 1852.*

CASTOR OIL SOAP.

Stuncke states that castor oil saponifies readily with alkalies, and gives with soda a solid white soap, which, in the form of pills, is a certain and agreeable purgative.—*Arch. der Pharm., and Ann. Pharm.*

ON ESSENTIAL OIL OF GINGER.

By A. PAPOUSEK.

The root of *Zingiber officinale* contains, according to Morin, an essential oil. To obtain this in sufficient quantity, ginger was submitted to distillation with water. With the water a yellow oil goes over, which possesses in a high degree the odor of ginger, and a burning aromatic taste. Its boiling point is 475°F. , its specific gravity 0.893.

The raw oil was deprived of water by pieces of fused chloride of calcium, and kept in a retort at a temperature below its boiling point. At 302°F. a colorless oil evaporated, which on analysis gave the following numbers:

Carbon	81.03	80 =	81.49
Hydrogen	11.58	69	11.72
Oxygen	7.39	5	6.79

$\text{C}^{80}\text{H}^{69}\text{O}^5 = \text{C}^{80}\text{H}^{64} + 5\text{HO}$. This oil is therefore a mixture of hydrates of a hydrocarbon isomeric with oil of turpentine.

As the oil acquired a darker color and began to undergo decomposition (as was known by the formation of water) when the heat was continued, the distillation was carried no further.

The raw oil was repeatedly distilled with anhydrous phosphoric acid. The yellow distillate gave the following numbers on analysis:

Carbon	87.99	10 =	88.24
Hydrogen	11.88	8	11.76

The formula C^{10}H^8 places this oil with the numerous series of hydrocarbons usually characterised as the camphene series. The separation of the hydrate-water appears to be effected with equal ease by the action of muriatic acid, as by that of anhydrous phosphoric acid.

If muriatic acid gas be passed into the raw oil, the latter acquires a brown color, even if care has been taken by cooling that the action should not be too violent. The brown oil, saturated with muriatic acid, was washed with water, then submitted to distillation with water, and the product, which is of a yellowish color and contains chlorine, dried over chloride of calcium. As shown by analysis, these operations, employed for the purpose of purification, partially decompose the muriatic acid compound, forming a mixture of a muriatic acid compound

in an unchanged state with a hydrocarbon which has lost its muriatic acid. Analysis gave—

Carbon	73.39	80 =	73.45
Hydrogen	10.36	67	10.25
Chlorine		3	16.30

$C^{30} H^{67} Cl^3 = C^{30} H^{64} + 3ClH$. This formula may be split in the following manner: $3(C^{20} H^{16}, ClH) + C^{30} H^{16}$.

According to this, the essential oil of ginger belongs to the same class of essential oils as the coriander oil. The ginger employed so plentifully as an aromatic in cookery must therefore also belong to the camphene group of aromatics.—*Lond. Chem. Gazette, from Sitzungsab. der Akad. der Wissensch. zu Wien. July, 1852.*

ON CORIANDER OIL.

By A. KAWALIER.

The fruit of *Coriandrum sativum* was pounded and subjected to distillation with water. The oil which swims on the water which distills over is yellowish, nearly colorless, and possesses the odor and taste of coriander in a high degree. In a very diluted state the odor of this oil resembles that of orange blossoms. Its specific gravity at 57° F. is 0.871, its boiling point 302° F. In ascertaining the composition of this oil, for the first and second experiments it was allowed to stand over chloride of calcium; for the third, a large quantity of the oil was exposed in a retort on the oil bath to a temperature below its boiling point. The portion of oil which came over last was employed for the analysis. The air was removed from the distilling apparatus during the investigations by means of carbonic acid. The analysis gave—

Carbon	77.62	78.01	77.73	10 =	750.0	77.92
Hydrogen	11.64	11.69	11.63	9	112.5	11.69
Oxygen	10.74	10.30	10.64	1	100.0	10.39

The formula $C^{10} H^9 O$ is the same that expresses the composition of Borneo camphor. Coriander oil is therefore to be considered as the hydrate of an oil having the same composition as oil of turpentine, $C^{10} H^9 O = C^{10} H^8 + HO$.

If the oil mixed with anhydrous phosphoric acid, be repeatedly submitted to distillation, a yellowish oil, of a nauseous odor, of the composition of oil of turpentine, is obtained. This contains

Carbon	88.28	10 =	750	88.23
Hydrogen	11.78	8	100	11.77

A stream of muriatic acid was passed into the crude oil, care being taken, by surrounding the vessel with ice, that the temperature should not rise too high. No crystalline compound was obtained in this manner. The product of the operation was washed with water to which some carbonate of soda had been added, dried over chloride of calcium, and submitted to analysis, it gave—

Carbon	67.51	67.51	40 =	3000.00	67.81
Hydrogen	10.50	9.52	35	437.50	9.89
Chlorine	20.40	20.40	2	886.56	20.04
Oxygen	1.59	2.57	1	100.00	2.26
$C^{40} H^{35} Cl^2 O = (C^{20} H^{16}, HO + HCl) + (C^{20} H^{16}, ClH).$					

Another portion of powdered coriander, distilled with water, gave an oil agreeing in all its properties with the above-mentioned. It was deprived of water by chloride of calcium, and submitted to distillation by itself at a temperature below its boiling point. The portion first evaporated possessed (as shown by analysis I.) the same composition as that which came over last (analysis II.):

	I.	II.			
Carbon	85.67	85.47	80 =	6000.0	85.41
Hydrogen	11.58	85.47	66	825.0	11.74
Oxygen	2.75	2.94	2	200.0	2.85
$C^{80} H^{66} O^2 = 4(C^{20} H^{16}) + 2HO, \text{ or } 2(C^{20} H^{16}) + 2(C^{20} H^{16}, HO).$					

Coriander oil, according to these experiments, is an oil of the camphene family, and contains various quantities of hydrate water, which can be extracted by anhydrous phosphoric acid (not by chloride of calcium,) in consequence of which it passes over into a hydrocarbon isomeric with oil of turpentine. The fruit of the coriander is frequently employed for the seasoning of cakes and similar articles. It follows, from the above results, that the coriander belongs to the spices of the camphene group, in which are included cloves, pepper, juniper, cummin, parsley,

calamus, the rinds of citrons, oranges and limes, and wormwood.
—*Lond. Chem. Gazette, from Sitzungsber. du Kaiserl. Akad. du Wiss.*, ix. p. 313.

TESTS TO ASCERTAIN THE GENUINENESS OF BALSAM OF
COPAIBA.

By M. GUIBOURT.

M. Guibourt, being one of a commission appointed by the "École de Pharmacie de Paris" to examine and report on the quality of the copaiba contained in the capsules manufactured in such great variety at the present day, took advantage of the opportunity to examine the different samples of this drug found in commerce, so as to find the best means of recognizing the purity of this vegetable product.

Copaiba is not the product of a single tree, but is drawn from seven or eight species of *Copaifera* growing in America, from the Brazils to Mexico and the Antilles. Thus it happens, that this oleo-resinous balsam may vary very much in its consistence, color, odor, and even in its chemical characters and composition, and, therefore, we should be very circumspect before pronouncing it to be adulterated.

Having taken a balsam of known purity as the type of the best copaiba, and to serve as a guide in the estimation of the other sorts, he adopted the following tests in each case, as characteristic of good copaiba:—

One part of the balsam mixed with 2 parts sulphuric ether.

One part of the balsam mixed with 2 parts absolute alcohol.

One part of the balsam mixed with 10 parts spirit of wine.

One part of the balsam mixed with 2-5ths of its weight of pure strong solution of ammonia, at 60° Fahr.

One part of the balsam mixed with 1-16th of its weight of recently calcined magnesia, and triturated some time in a mortar; then introduced into a bottle, and corked.

One part of the balsam treated in the same manner, with one-fourth its weight of carbonate of magnesia.

One or two drachms of the balsam boiled in three or four pints of water, till the liquid is reduced to half a pint.

From a great variety of samples, all treated in the same manner, the Professor deduces the following conclusions:—

1. A copaiba which possesses the four properties :—*First*, of being entirely soluble in two parts of absolute alcohol. *Second*, to form at the temperature of 60° Fahr. a transparent mixture, with two-fifths of its weight of a strong solution of ammonia. *Third*, to solidify with one-sixteenth its weight of calcined magnesia. *Fourth*, to produce a dry and brittle resin after prolonged ebullition with water, is a balsam which is certainly pure ; and those which present these four properties are to be preferred to all others.

2. The last character is an indispensable complement to the three first, which alone are not sufficient to certify the purity of the balsam. On the other hand, one or two of the first characters may be wanting, without necessarily involving the adulteration of the balsam. When these characters are wanting, we must try to discover the presence of some foreign substance ; but unless we can prove its presence, we must not conclude that the balsam has been adulterated—it may arise from some unknown properties in the variety of the tree from which it is produced.

3. The characters drawn from the action of ammonia, and of calcined and carbonate of magnesia, and which have been regarded as the most certain means of detecting the adulteration of copaiba by a fixed oil, are far from possessing that value which has been assigned to them. The soft state of the resin of copaiba, deprived of its volatile oil by boiling in water, is a much more certain test of this falsification.—*Annals of Pharmacy*, Jan. 1853, from *Journal de Pharmacie*.

ON SABADILLINE.

By FR. HÜBSCHMANN.

It is known that Couërbe has discovered in sabadilla seed, besides veratrine, a second organic base, which he has named sabadilline. He obtained it by boiling the impure veratrine, precipitated by potash or soda, with water, from which it crystallizes out by cooling. E. Simon afterwards regarded this sabadilline of Couërbe as a double compound of resin and soda with resinous veratrine, from whose solutions in sulphuric acid, pure veratrine could be precipitated by means of ammonia.

The author now shows, by the following research with a body

which he has obtained, by treating his veratrine with ether, as a residue, that this residue is sabadilline, and thus proves the existence of this alkaloid.

Sabadilline is a white amorphous powder, which, when rubbed in a mortar, does not cause sneezing; whereas, veratrine, as is well known, irritates the nose.

Sabadilline is only taken up as a trace by ether, whilst veratrine is extremely soluble therein.

Sabadilline dissolves in 143 parts of boiling water. This solution is not rendered turbid by ammonia; but very much so, by carbonate of potash, which, however, precipitates only two-thirds of the dissolved alkaloid; this precipitate, by heating the solution, forms into a resinous mass. Veratrine does not dissolve in water in an observable degree.

A solution of 1 part of sabadilline in 4 parts of diluted sulphuric acid, and 100 parts of water, does not become turbid with ammonia. A similarly prepared solution of veratrine gives, with ammonia, a strong turbidity.—*Annals of Pharmacy*, Jan. 1853.

ON THE PREPARATION OF IODIDE OF AMMONIUM.

By JOHN A. SPENCER.

(Read before the Chemical Discussion Society.)

The salt, iodide of ammonium, having lately been used, and, from its possessing certain advantages over the similar compound of potassium, being likely to come into more extensive use among those practising photography, I am induced to lay before the Society a method I have adopted for preparing the substance in question, of greater purity and with more facility than those processes which are given in most works on chemistry, viz., by the double decomposition of solutions of iodide of iron or zinc by carbonate of ammonia, filtering, washing the precipitate, and evaporating the solution to dryness. These methods do not usually yield an unexceptionable product, as it is generally of a yellowish color, while the pure salt is perfectly white; they also require a comparatively large quantity of water, to prevent losing much of the salt in the precipitate.

The action of iodine on solution of ammonia, differs, as is well

known, from that upon the fixed and caustic alkalies; in the latter case, an iodide and iodate of the metal is formed, which may be separated either by alcohol, which leaves the iodate untouched, or the iodate may be converted, by exposure to a red heat, into iodide. By acting on *ammonia* with iodine, only a small portion of iodide of ammonium is formed, accompanied by that most formidable substance, iodide of nitrogen, a substance whose explosive properties render it an operation of danger to prepare it in large quantities; but if, instead of using caustic ammonia, a solution of *sulphide of ammonium* be used, the reaction which ensues is perfectly safe, and gives us the salt in question very readily. The operation is very simple. A quantity of pure iodine is placed in a flask with a small quantity of water, and sulphide of ammonium added to it till the liquid loses its red color, and is turbid only from separation of sulphur; the flask is then agitated till the sulphur, for the most part, agglomerates into a mass, the liquid poured off, and, if necessary, ammonia added to it till it manifests a slightly alkaline reaction, and then boiled till all odor of sulphuretted hydrogen and of ammonia is lost, then filtered, which is done with great facility, and evaporated at a boiling heat, constantly stirring from the edges of the vessel, till it becomes a pasty mass, when it is immediately transferred to a water bath, and the stirring continued till the salt is dry. It then forms a beautifully white and crystalline powder, which will keep for some time, if carefully excluded from the air, but which, after the lapse of a few weeks, becomes yellowish, and at last brown; it may, however, be easily restored, by adding a little solution of sulphuretted hydrogen till colorless, filtering, and evaporating to dryness. By means of this process, a pound of the substance may be procured, in a perfectly pure condition, in a couple of hours, while by the old method, a much longer time would be necessary, and the product be not so good.—*Annals of Pharm.*, Jan., 1853.

ON PHYSALINE.

By V. DESSAIGNES and J. CHAUTARD.

The bitter principle of *Physalis alkekengi* has been employed for some time with success in the treatment of fever, and the

authors have consequently attempted its isolation. Every part of the *Physalis* is bitter, especially the leaves and fruit-capsules. The alcoholic extract of the plant yielded a bitter dark-colored mass. The bitter principle is taken up by cold water, and was separated either by means of charcoal, from which it was afterwards dissolved by alcohol, or by shaking the aqueous solution with chloroform. The bitter principle thus obtained was pulverulent, slightly colored, and very bitter.

Physaline $C_{28}H_{32}O_{10}$, prepared in the last-mentioned manner, is, when pure, a white powder, with a faint tinge of yellow; its taste is at first faintly, afterwards permanently bitter; it is uncrystalline, softens at 356° or 374° F., and then soon decomposes, burning with a smoky flame. It is very sparingly soluble in cold water, to which it communicates a bitter taste; more soluble in hot water, chloroform and alcohol; and sparingly soluble in ether and acids. It is also dissolved by ammonia, and remains unaltered after its volatilization. It is not precipitated by nitrate of silver and ammonia from the alcoholic solution; it is precipitated by an ammoniacal solution of acetate of lead. Dried *in vacuo*, it gave on analysis—

Carbon, . . .	63.78	63.57	28	63.64
Hydrogen, . .	6.33	6.30	32	6.06
Oxygen, . . .	—	—	10	30.30

Compound of Physaline with Oxide of Lead, $C_{28}H_{30}O^9 + 3PbO$.—Prepared as above and dried *in vacuo*, it gave on analysis 54.34 per cent. oxide of lead; theory requires 56.70. The authors do not consider their analyses as decisive. The composition of enicine, the bitter principle of *Carduus benedictus*, approximates very closely to the above:—Carbon, 62.9; hydrogen, 6.9; oxygen, 30.2. The fruit of the *Physalis* contains citric acid.—*Ibid*, from *Journ. de Pharm. et de Chim.*, 3rd ser., vol. xxi. p. 24–27.

NEWLY-DISCOVERED SALT OF QUININE.

Dr. William Herapath, of Bristol, [Eng.,] in a paper communicated to the Philosophical Magazine, has drawn attention to the optical properties of a newly-discovered salt of quinine,

which crystalline substance possesses the power of polarizing a ray of light like tourmaline, and, at certain angles of rotation, of depolarizing it, like selenite. By dissolving the disulphates of quinine and cinchonine of commerce in concentrated acetic acid, upon warming the solution, and dropping into it a spirituous solution of iodine carefully by small quantities at a time, and placing the mixture aside for some hours, large brilliant plates of this substance were produced. Iodine, sulphuric acid, and quinine, are the constituent elements of this substance. Dr. Herapath considers it probable that these are arranged as a binary compound; the disulphate of quinine acting as a feeble electro-positive base, to the iodine as an electro-negative. He considers it, therefore, to be an iodide of the disulphate of quinine. The crystals of this salt, when examined by reflected light, have a brilliant emerald-green color, with almost a metallic lustre; they appear like portions of the elytra of cantharides, and are also very similar to murexide in appearance. When examined by transmitted light, they scarcely possess any color, there is only a slightly olive-green tinge; but if two crystals crossing at right angles be examined, the spot where they intersect appears as black as midnight, even if the crystals are not $\frac{1}{300}$ of an inch in thickness. If the light used in this experiment be in the slightest degree polarized, as by reflection from a cloud, or by the blue sky, or from the glass surface of the mirror of the microscope placed at the polarizing angle, $56^{\circ} 45'$, these little prisms immediately assume complementary colors. One appears green and the other pink; and the part at which they cross is a deep chocolate or chestnut brown, instead of black. In performing optical experiments with this peculiar salt, Dr. Herapath says, that it is not necessary to employ a tourmaline; the whole phenomena may be exhibited with equal brilliancy by using two plates of iodide of the disulphate of quinine; one as a polarizer, the other as an analyzer, the selenite and disulphate of quinine being interposed. This fully establishes the fact of this substance possessing optical properties precisely equivalent to those of a tourmaline, or of a Nicol's prism, and will be sufficient to show that all the phenomena capable of being produced by the one may be exhibited by the other. Dr. Herapath further states, that this newly-

discovered substance possesses the power of polarizing a ray of light with at least five times the intensity that the best tourmaline is capable of, and that it must consequently be the most powerful polarizing substance known. In his paper in the Philosophical Magazine, to which I am indebted for the above information, Dr. Herapath enters at great length into the chemical characters of this iodide of the disulphate of quinine. In his examination of its optical properties, he employed one of Oberhauser's achromatic microscopes, with a half-inch object-glass and No. 2 eyepiece; a low power, under 100 diameters.—*Annals of Pharm.*, May 1852.

PILLS OF IODIDE OF IRON.

By JOHN LOINES.

The intensely styptic taste of the solution of iodide of iron as well as the unpleasant stain it imparts to the teeth and lips is often felt to be a serious inconvenience in the use of this valuable remedy, and has given rise to considerable inquiry by the medical practitioner for some more palatable mode of administering the iodide. Such, however, is the nature of this compound, that it is scarcely to be expected that any form of preparation will supersede the salt with gum or the combination of saccharine matter in various proportions. Meantime it has been proposed, in order to conceal the taste of the officinal solution, to enclose it in capsules, or, by the addition of suitable substances, to make of it a mass capable of being formed into pills. It has even been thought advisable to evaporate the solution till it should acquire a suitable consistence for this purpose. To the capsules the expense will probably be urged as an objection by some, while their liability to leak, unless made with more than ordinary care, will be found a constant source of complaint. On the other hand, although it is easy enough, by the addition of gum, to make a mass that can be rolled into pills, the bulk of this adjuvant in connection with that of the sugar already employed renders the dose inconveniently large. It was in view of these objections that the writer, about a year ago, devised the plan of making a very concentrated syrup of the iodide of iron, which may be readily made into pills, two or three of which contain the

ordinary dose of that medicine, and having made use of them in his own case for a considerable time, with advantage, he would respectfully recommend them to the favorable notice of physicians and pharmacutists. The formula he employs is the following viz :

Take of iodine (dry).	1 oz.
fine iron wire, cut in pieces.	3 5.
Sugar in powder.	24 oz.
Water.	14 fl. oz.

Measure $2\frac{1}{2}$ fluid ounces of water into a three or four ounce phial, and mark upon it the height at which the liquid stands, then pour out the water and introduce the sugar in its stead. Proceed, with the other ingredients, to make the solution of iodide of iron in the same manner as in the formula of the U. S. P. taking care to use a flask or matrass of the capacity of only 3 or 4 ounces in order to avoid waste of the materials. The filter employed should also be very small (from one to two inches in depth) and its apex must be protected by a small cap of muslin, without which a rent is almost certain to occur ; or, a small piece of fine linen or muslin might be substituted for the double filter thus formed. Having filtered the liquid into the sugar, shake the phial containing them, and suspend it in a vessel of hot water until perfect solution takes place. If the product measures less than $2\frac{1}{2}$ fluid ounces, add simple syrup to make up the deficiency.

This concentrated syrup is four times the strength of the official solution, and should contain, by calculation, twenty-nine grains of the dry iodide in every fluid drachm. As some loss is, however, unavoidable, the proportion is actually, rather less.

To prepare the pills, two fluid drachms of the concentrated syrup are to be triturated in a mortar, with 3 drachms of powdered gum arabic, and the mixture set aside for several hours, during which time it acquires the consistence of very stiff paste, but needs the addition of a little more gum, which should be worked in by hand, to make it into pills. When brought to the proper consistence, it is to be divided into 60 pills, each of which may be assumed to contain the equivalent of 8 minims of the official solution of iodide of iron. They do not become hard by keeping;

some have been kept a year, and then beaten anew into a mass and made again into pills. Neither does any perceptible alteration appear in their color, taste or smell.*—*N. Y. Jour. Pharm.*, January, 1853.

ON THE PURIFICATION OF SAL-AMMONIAC.

By HENRY WURTZ.

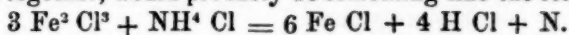
Many chemists must have become aware that the loaves of sal-ammoniac which occur in commerce almost invariably contain iron in some form of combination. It is the separation of this iron which is particularly to be brought under consideration in this paper. The occurrence of this contamination is not noticed by Gmelin, but I find that Pereira in his *Materia Medica*, mentions it, apparently entertaining the opinion, however, that the iron is contained exclusively in the brownish yellow layers which usually appear in a section of one of the loaves. He remarks,† “For several years past I have been accustomed to demonstrate in the Lecture-room that a solution of these yellow bands in water gives no traces of iron on the addition of ferrocyanide of potassium, until a few drops of nitric acid be added, when a copious blue precipitate is formed; and I therefore inferred that this yellow matter was a double chloride of iron and ammonium. My opinion has been fully confirmed by the experiments of Dr. G. H. Jackson.”

In the examination of several specimens of commercial sal-ammoniac, however, I have myself found the quantity of protochloride of iron in the transparent colorless portions of the mass to be apparently equal to that in the yellow portions. Neither the colorless nor the yellow portions give any reaction with yellow prussiate of potash or with sulphocyanide of potassium, or any precipitate upon heating with ammonia; but strong solutions of each are equally blackened by sulphide of ammonium, and after boiling with a drop of nitric acid give quite considerable and apparently equal flocky-brown precipitates of hydrated sesquioxide of iron upon heating with ammonia, and apparently

* The reader is referred to a formula for pills of iodide of iron, suggested by Mr. H. W. Worthington, (*Amer. Jour. Pharm.*, vol. xv. p. 71) in which tragacanth and honey are employed very much in the way recommended above by Mr. Loines, for gum and sugar.—*Editor Amer. Jour. Phar.*

† Pereira's *Materia Medica*, i., 446.

about the same blue coloration with prussiate of potash, and red with sulphocyanide of potassium. The yellow substance in the colored bands I am disposed to regard as some organic matter. The iron is evidently all present in the form of protochloride, which has sublimed together with the vapor of the sal-ammoniac in the process of manufacture. In fact, judging *a priori* from the well known reducing properties of sal-ammoniac, when aided by heat, the presence of sesquichloride of iron, which, from its yellow color, and easy volatility previous to examination, would naturally be supposed present in the yellow portions, seems improbable. The reaction between sal-ammoniac and sesquichloride of iron, when heated together, would probably be something like the following:



The sesquichloride of iron being thus converted into protochloride.

Gmelin* who does not notice the presence of iron, states that commercial sal-ammoniac may be purified both by resublimation and recrystallization. To test this, two experiments were made. First, a quantity of crude sal-ammoniac was slowly and carefully sublimed in a glass tube. An aqueous solution of the sublimate which, it is worthy of observation, had a slightly brown color, and an empyreumatic smell, when tested with prussiate of potash and sulphide of ammonium, still gave most unmistakeable indications of the presence of protochloride of iron. Next, some of the crude sal-ammoniac was crystallized from water—the crystals rinsed with distilled water and dried by strong pressure between folds of filtering paper. A solution of these crystals still gave a coloration, though faint, with sulphide of ammonium. By two or more recrystallizations every trace of iron might, in all probability, be separated, but at the expense of a large loss of material.

While an instructor in the Chemical School, connected with Yale College, at New Haven, I became acquainted with a method of separating the iron from ferriferous sal-ammoniac, devised, I believe, by Mr. Wm. H. Brewer, a former student in that institution, and in common use in the analytical department for the preparation of pure sal-ammoniac solution, for use in analysis, which leaves nothing whatever to be desired in point of economy, perfection and facility of execution; and as Mr. Brewer has never, to my knowledge, published his process, I have concluded, in view

*Handbuch der Chemie, i., 887.

of the importance of the matter and the fact that I have myself verified the accuracy of the process by repeated trials, to make it public.

Brewer's process was founded upon the hypothesis, confirmed as above by Pereira and myself, that the iron is in the form of protochloride, and consists simply of a conversion of this protochloride into sesquichloride by passing a few bubbles of *chlorine* gas through a nearly saturated hot solution of crude sal-ammoniac, and the subsequent decomposition of the sesquichloride of iron by ammonia. The solution is then kept hot on the sand bath for a short time, or until the precipitate separates in flocks, and then quickly filtered while hot. On cooling, the sal-ammoniac crystallizes out absolutely pure.

When passing the chlorine gas into the liquid, special care must be taken to keep the liquid hot, and not to prolong the action sufficiently to allow the formation of the well known dangerously explosive compound NHCl^2 ,* usually called chloride of nitrogen. It is evident that the sal-ammoniac obtained cannot contain any free chlorine, all the chlorine introduced being converted into chlorohydric acid, which combines with the excess of ammonia, or according to the long known reaction,



ON A NEW TEST FOR IODIDES.

By DAVID S. PRICE, Ph. D., F. C. S.

Having in the preceding paper† pointed out the principle on which the detection of nitrites by means of iodide of potassium and hydrochloric acid depends, I shall proceed briefly to describe the application of nitrites for the detection of iodides, and at the same time give one or two instances of the practical application of the test in cases where the quantity of iodine is exceedingly small.

The method of employing the test is the following. The liquid

*The discovery by Adolphe Wurtz, of the detonating compound formed by the action of chlorine upon ethylamine, and called by him "*l'ethylamine bichlore*," (*Memoire sur les ammoniacques composees, par M. Ad. Wurtz, p. 33*) leaves us hardly any alternative, if we consider the perfect analogy between the two cases, than to assign the above formula to the *soi-disant* chloride of nitrogen.

†See Chem. Gazette vol. ix. p. 290.

suspected to contain an iodide is mixed with starch-paste and acidified with hydrochloric acid; a solution of nitrite of potash is then added, when, if much iodine be present, a dark blue color will be instantly produced; if a very small quantity only, as for instance the two or three millionth part, then a few seconds elapse before the blue color makes its appearance. In this manner I have detected the 1-4000,00th part of iodine dissolved in water as iodide of potassium. It will be seen that the test admits of a degree of delicacy not attainable by any of the other methods for detecting iodides, as well as being at the same time free from the disadvantages to which they are more or less subject; as, for instance, in the employment of chlorine, which, unless added very carefully to a liquid containing a trace of an iodide only, is almost sure to afford a negative result, from the chlorine combining with the iodine, and so preventing its acting on the starch. The same error may also arise by the use of nitric acid should the suspected liquid contain a large amount of chlorides.

I will now detail the two cases in which I have applied this test; in the one for the purpose of detecting iodine in cod-liver oil, the object being to see how small a quantity of the oil would suffice; in the other, for the purpose of detecting iodine in marine vegetation. One ounce of ordinary brown cod-liver oil was saponified by a concentrated solution of caustic potash, and then carbonized in an iron spoon over an open fire; the residue was removed into a covered porcelain crucible, and strongly heated, so as effectually to destroy all organic matter, and when cold was digested with a small quantity of water, and thrown upon a filter; the filtrate, being acidified with hydrochloric acid, was then mixed with starch-paste, and tested with nitrite of potash, which almost immediately produced a pale plum color.

Sea-water contains so small an amount of iodine, that it is exceedingly difficult to detect even a trace of it in the mother-liquor from several pounds of water. Minute as this quantity must be, it is nevertheless collected and assimilated by many marine plants, and the following experiments enable us to demonstrate its presence in their juices. If we take a thin transverse sectional slice of the stem of the *Fucus laminaria digitata*, moisten it with a little starch-paste and dilute hydrochloric acid, and examine it by the aid of the microscope, we shall, upon adding a drop of a solution of nitrite of potash to the same, be able

most distinctly to observe the formation of iodide of starch. The presence of an iodide may be shown in a still more marked manner, by suspending the stem of the same plant in a dry atmosphere, when the surface, after the lapse of some hours or days, will become covered with numerous transparent crystals, which on examination will be found to consist principally of chlorides, but at the same time to contain so much of an iodine compound as to impart an intense blue color to the test-mixture.

Many marine plants, when placed in a fresh state in contact with the test-mixture, impart an orange color to it, owing to the liberation of bromine.—*Quart. Journ. of Chem. Soc.*, iv. p. 155.

A FALSE ISINGLASS FROM PARA.

A substance has lately been imported, under the name of Isinglass, which, on examination, proves not to be isinglass, but the dried ovary of a large fish.

Two boxes were imported: they did not contain more than 14 or 16 lbs. A similar article has been before imported into London. They somewhat resemble a bunch of grapes; and consist of ovoid or rounded masses, attached by peduncles to a central axis; by immersion in water this axis is found to consist of a convoluted membrane, to one side only of which these ovoid masses are attached.

A very superficial examination of this so-called isinglass, proves that it is neither the swimming bladder of a fish, nor is it gelatinous; but it is in reality the ovary of some large fish, and is of an albuminous nature. When soaked in water its fishy odor becomes very obvious.

The ovoid masses are *ova*. They are highly vascular on the surface, and are filled with an animal substance of a yellow color. In general appearance they resemble the vitellus of a shark or ray.

The *Sudis Gyas*, a large osseous fish, upwards of six feet in length, is found at Para. Its flesh is dried, salted, and eaten by the lower classes; and its swimming bladder constitutes one of the kinds of Brazilian isinglass imported into London. It is probable, therefore, that the ovary of this fish constitutes the false isinglass in question. If not from this fish, it is probably obtained from some allied genus (as *Amia*) of highly organized osseous fishes.—*Pharm. Journ.*, Jan. 1, 1853.

ON A NEW CRYSTALLINE BODY FROM HELLEBORUS NIGER.

By WILLIAM BASTICK.

(Read before the Pharmaceutical Society.)

The natural order *Ranunculaceæ* contains a number of plants of great activity on the animal economy, and most of these employed as medicinal agents have been thoroughly examined by chemists, by whom their active principles have been separated beyond doubt. It has been found, as is well known, that these active principles are organic bases of extreme virulence, and possess the properties of the plants from which they are derived in a highly concentrated form. Black hellebore root has been several times examined for the purpose of ascertaining what were its active constituents, and more especially to learn whether, like other members of this family, it contained an organic base. Vauquelin ascribed its activity to the presence of an acrid oil, and Gmelin to a soft resin which exists in it. The most recent and complete examination of black hellebore root is that of MM. Feneulle and Capron, whose researches were principally directed to prove the absence or presence of an alkaloid in this root. However, they came to the conclusion that no such body existed in it, and that its activity was due to a combination of a fatty oil with a volatile acid, which they separated from it. Doubting the truth of their conclusions, and reasoning from analogy, I was led to believe that, by the improved methods of research of the present day, an organic base might be extracted from it. I therefore adopted a method which experience has shown will eliminate an alkaloid from any substance, if any such alkaloid, soluble in ether, exist therein, and which is as follows:—

The black hellebore root was finely bruised, and macerated with alcohol, containing 1-50th part of strong sulphuric acid. After three days, the tincture was filtered from the root, and supersaturated with calcined magnesia. The liquid was then filtered, and sufficient sulphuric acid added to it to render it slightly acid. It was again filtered, to remove the sulphate of magnesia formed. The filtrate was now mixed with twice its volume of distilled water, and the mixture evaporated, to expel the alcohol, and to reduce considerably the bulk of the solution. To remove the soft resin, which was separated by replacing the alcoholic menstruum with water,

filtration was resorted to. The concentrated fluid was then carefully saturated with carbonate of potash, but nothing was precipitated. A large excess of that carbonate was now added, and the solution agitated for some time with four times its volume of ether, and afterwards set aside, so that the ethereal part of the liquid might separate from the watery portion. When this separation had taken place, the ethereal portion was removed from the bottle by means of a pipette, and exposed to spontaneous evaporation in a capsule. Had an organic base been present in the root, it would have been found in the ethereal solution; but this solution was entirely free from any reaction on litmus paper. Thus far my experiments corroborate those of MM. Feneulle and Capron, as to the non-existence in black hellebore root of any body having the more distinct characteristics of an alkaloid, but no further; for I found in the ethereal solution, by its evaporation, a well-defined *crystalline* organic body, to which I propose giving the name of *helleborine*; although that name has been already given to the soft resin by Gmelin, and undeservedly so, as I think, because it possesses no peculiarities, either physical or chemical.

This new body readily separates, by evaporation, from its watery alcoholic and ethereal solutions, in white translucent crystals. It is slightly soluble in water, more soluble in ether, and readily soluble in alcohol. It dissolves more freely in these liquids when they are heated. It is bitter to the taste, and produces on the tongue a tingling sensation, like the root. Strong sulphuric acid decomposes it, and gives with it a reddish-brown solution, which, when diluted with water, affords a brown precipitate. Concentrated nitric acid dissolves it; but does not oxidize it until the solution has been exposed to heat. After it had been thus oxidized, the usual tests showed that oxalic acid was not one of the products. This substance is not volatile, and when heated, is decomposed and leaves a carbonaceous residuum, but does not inflame. It is, as previously indicated, entirely without reaction on litmus paper, and does not combine with or saturate acids or alkalies. A dilute solution of caustic potash appears to produce no change in it, as is also the case with dilute mineral acids. It is not precipitated from its solutions by acetate of lead, bichloride of mercury, or iodide of potassium. When heated in a dry state with fused caustic potash in

a tube, ammonia is evolved, which shows that it is a nitrogenous body. It therefore closely resembles piperine in many of its properties, which is classed amongst the alkaloids, although, like helleborine, it is devoid of alkaline reaction; but whether it possesses an elementary constitution similar to that of piperine, or the alkaloids in general, remains to be determined by ultimate analysis.

Having so far endeavored to learn its characters, I proceeded to ascertain if this new body could not be extracted from black hellebore root by a more simple process. I treated the bruised root with alcohol, to form a strong tincture. The filtered tincture was diluted with water, and heated for some time, to expel the alcohol. The aqueous solution was then filtered, to remove the separated resin, and afterwards further evaporated, when some helleborine crystallized out of the solution; but in a less pure condition than by the former process. Consequently, I treated the solution with carbonate of potash in excess, and agitated it with three or four times its volume of ether, which extracted the helleborine almost in a state of purity. This substance may be further purified by solution in alcohol, and recrystallization.

It is probable, from this latter process, that helleborine exists in an uncombined state in the root, and that it is the soft resin contained therein which chiefly interferes with its extraction and recognition by a simple solvent as a crystalline substance. There is also a free acid in black hellebore root, which it is necessary to neutralize with a base before the helleborine is extracted from its aqueous solution with ether, as it contaminates the product. This is not gallic acid, which is said to exist in this root, according to the analysis of MM. Feneulle and Capron, as it did not give a black precipitate with a persalt of iron, but a brown gelatinous one; it also afforded white precipitates with acetate of lead, and with nitrate of silver. Neither is it the volatile acid found by them, as it is not expelled from its solutions by long boiling. It seems to resemble closely the aconitic acid found in another member of the natural order *Ranunculaceæ*, especially when it is remembered that, like that acid, it is soluble when free in alcohol, ether, and water.

It may be mentioned that, in consequence of the insolubility in ether of the coloring matter extracted by alcohol from black helle-

bore root, it is scarcely necessary to use animal charcoal to decolorize the helleborine, as its ethereal solution is colorless in the above process, and this substance crystallizes thereout, with care, nearly in the same condition.—*Annals of Pharmacy*, Dec. 1852.

NOTES UPON THE DRUGS OBSERVED AT ADEN, ARABIA.

BY JAMES VAUGHAN,

Member of the Royal College of England, Assistant Surgeon in the Bombay Army, Civil and Port Surgeon at Aden, Arabia.

Communicated by Daniel Hanbury.

GUM ARABIC, *Gummi acaciæ*, known in Arabia and on the African coast by the name of *Sumgh*. The acacia which yields this gum is generally a small shrub of a dry and withered appearance; occasionally, however, it shoots out into a tree of from twenty to thirty feet high. The Somalis on the north-eastern coast of Africa collect the gum during the months of December and January. The process of obtaining it is extremely simple: long incisions are made in the stem and branches from which the juice flows, and when dry, is removed. After the gum of a district has been gathered, it is sewn up in goat-skins, and brought on camels to the great Berbera fair, or to some of the small settlements on the coast, and thence shipped for Aden and India. Three descriptions of the gum, styled severally *Felick*, *Zeila*, and *Berbera*, are exported from the Somali coast.

1. *Felick Gum* is collected chiefly by the Magartain* Somalis and those who inhabit the district of Gardaf or Cape Gardafui. None of this quality, which is esteemed the best, finds its way to Aden; a little reaches Maculla and Shehr on the Arabian coast, but the mass is usually bought up by the Banians,† and shipped direct for India. The *Gum Felick* realizes about twenty-five rupees‡ the hundredweight in the Bombay market.

2. *Zeila Gum*, so called from the port of that name, and

3. *Berbera Gum*, from the district of Berbera. The former of these is sold for fifteen, and the latter for thirteen rupees the hundredweight in the Bombay bazaar.

The acacia is common throughout Yaman and Hadramaut, but

* Otherwise *Meggertein*, or *Mijjertheyn*.—D. H.

† Hindoo Merchants.

‡ The rupee is equal to two shillings sterling.

the Arabs do not appear to appreciate the shrub, as but very little gum is collected by them. The gum forms, however, an important ingredient in the preparation of their writing-ink, to which it gives that glossy appearance so much admired in old Arabian manuscripts. They also use it occasionally as a demulcent and nutrient, and give it in the form of mucilage to invalids, as we do arrowroot, sago, &c. The Somalis resident at Aden occasionally go a short distance into the interior and gather small quantities, which they immediately sell in the bazaar. The natives on the south-east coast of Arabia between Aden and Maculla also collect a little, but of this scarcely any is exported. During the past year (1851) 250 tons of Gum Arabic passed through the Aden custom-house. The selling price here is from $2\frac{1}{4}$ to 3 rupees the *maund* of twenty-eight pounds.

MYRRH.—This gum-resin, sometimes called *Murr* by the Arabs, but more commonly in this district by the Indian name of *Heera Bôl*, is collected in great quantities by the Somalis in the north-east part of Africa and in the neighbourhood of Hurrur further south. It is generally brought to the large fair held at Berbera, during the months of November, December and January, and is there bought up for the most part by the Banians of India, and paid for principally in piece goods: barter, indeed, is the system upon which most commercial transactions are carried on in that district. Occasionally, the articles obtained are carried thither direct; but more frequently they are first brought over to Aden, and thence shipped for Bombay. Within the last few months, small quantities of the best description of myrrh have been collected in a district forty miles to the east of Aden, and brought hither for sale.* This has been done by the Somalis; but there can be little doubt that as soon as the native Arabs become acquainted with this valuable product of their country, the trade therein will considerably increase.

* This information which I give from personal knowledge, may serve to correct a statement made by Dr. Malcolmson and reproduced in Royle's *Manual of Materia Medica*, that "there is no myrrh produced in Arabia." And I am further of opinion, notwithstanding the late researches of Dr. Carter, who fixes the limit of the Libanophorous regions of Ptolemy to $52^{\circ} 47'$ east longitude, and expresses his belief that the myrrh-tree does not exist there, that further investigations eastward from Aden will eventually substantiate the fact recorded by Theophrastus in his *Historia Plantarum*, lib. ix. cap. 4, that the frankincense and myrrh trees were seen growing together in Southern Arabia.

Four hundred and fifty hundredweights of myrrh passed through the Aden custom-house last year, some of which was taken to America by American vessels, but the greater part was shipped for Bombay. The selling price here is $9\frac{1}{2}$ rupees the *maund* of twenty-eight pounds.*

BISSA BÔL (Arabic), *Hebbakhade* of the Somalis.—This is the name of another gum-resin which is collected by the Somalis on the opposite coast and brought hither for sale or exportation. In appearance it resembles the myrrh already described; and the natives tell me that the tree from which it is obtained also resembles the Hearsa Bôl tree, but is nevertheless a distinct variety. I have not met with any description of this gum, and my impression is, that the tree which produces it is yet unknown to Europeans. It is brought over with the myrrh and other gums by the Somalis, but does not appear to be very plentiful, as I find that only seventy *maunds* passed through the custom-house last year. Here it realizes $2\frac{1}{2}$ rupees per *maund*, and is sent from Aden to India and China, where it is mixed with the food given to milch cows and buffaloes, for the purpose of increasing the quantity and improving the quality of the milk. It is also used as a size, and when mixed with lime, it is said to impart a bright gloss to walls which are covered with it. I am not aware to what other purposes it may be applied; possibly it may possess other useful properties, with which the natives are unacquainted. So far as my information extends, none of this particular gum has yet found its way to Europe.†

* Specimens of two kinds of myrrh have been received from Mr. Vaughan. One, labelled *Somali* or *African Myrrh*, is the so-called *Turkey Myrrh* of commerce. The other, which is that produced forty miles to the eastward of Aden, is a gum-resin distinctly different, and, as the author suggests in another communication, doubtless the produce of some other tree than that affording common myrrh. It is in irregular pieces, varying in size from that of a walnut to less than that of a pea, not coated with dust like pieces of Turkey myrrh, but having a somewhat shining exterior. Each large piece appears to be formed by the cohesion of a number of small, rounded, somewhat transparent, externally shining, tears or drops. The fracture much resembles that of common myrrh, but wants the semicircular whitish markings. In odor and taste it agrees closely with true myrrh. Portions of a semi-transparent brown, papyraceous bark are occasionally attached to pieces of it. I have recently noticed a small quantity of this myrrh in the hands of a London drug broker.—D. H.

† This substance of which the author has forwarded a fine specimen, is usually regarded in England as a species of myrrh of inferior quality. It

HOTAI is the name of a gum produced by a small thorny tree which grows in the Somali country about Bunder Murayah. The tree or shrub is in appearance not unlike that which produces the myrrh, and attains the height of about six feet. The use of the gum, as far as I know at present, is confined to the Somalis themselves, and more especially to the females, who consider it a good detersive for the hair, and almost the only one they know or ever use. When steeped in fresh water, it yields a slight lather.*

OLIBANUM, styled *Lubán* by the Arabs and by the Somalis on the opposite coast, where the tree affording it grows in abundance. I believe that Olibanum is also known in Persia and in many parts of India under the name of *Kundor* and *Koodricum*, but not by the Arabs or Somalis. The *Lubán* tree is a native of the eastern coast of Africa, and flourishes on the high lands which intersect the whole of the Somali country, where I had an opportunity of seeing it in 1843, not far from Cape Gardafui. The hill-ranges on the eastern coast of Africa are composed entirely of white limestone, in some parts so compact as to resemble alabaster. This appears to be the soil most genial to the tree, and in no instance did I find it growing in sand or loam as has been supposed was the case. The tree is first met with a few miles inland from the coast, and at an altitude of about three hundred feet above the level of the sea. Its appearance is strikingly singular, seeming at first

was formerly known as *East Indian Myrrh*, but is now seldom so distinguished. A package from Bombay has been offered in the London market this year as *Gum Bhesaboll*. Bissa Ból is the *Myrrha Indica* of Drs. J. and E. Martiny (*Encyklopädie der Medicinisch-pharmaceutischen Naturalien und Rohwaarenkunde*, band 2, p. 98), as I found by a comparison with specimens in the possession of Dr. Julius Martiny. It is quite distinct from Indian and African *Bdellium*—D. H.

* *Gum Hotai*, judging from the sample sent to England by the author, consists of irregular pieces $1\frac{1}{2}$ to 1 inch in their longest diameter, frequently rounded on one side, as if portions of large tears, of entire smaller tears, and of angular little fragments, produced by the fracture of the masses. It is of wax-like opacity, cracked in all directions, and readily breaking up into angular pieces. On the exterior, the larger pieces are yellowish, brownish, or somewhat liver-colored, and occasionally, incrustated on one side with a reddish sand, upon which they appear to have fallen when in a soft state. Internally, the colors are generally paler or nearly white, sometimes darker toward the centre of the tear. The gum is nearly inodorous, but in taste is slightly bitter and acrid to the throat. A few fragments agitated with water in a vial speedily afford an emulsion which remains frothy and milky for many days.—D. H.

sight to be destitute of roots, and clinging to the hard, uncreviced rock by masses of rhomboid and fantastically-shaped wood with the most obstinate adherence. The stem is nearly at right angles with this substructure, ascending almost invariably in an upright direction, and attaining the height of from twelve to fifteen feet. At the base the circumference is equal to that of a man's thigh, gradually tapering towards the top where it shoots off its branches and leaves. The wood is white, fibrous and somewhat soft; the bark, which is about half an inch in thickness, is of a light brown color, very succulent and covered with a glossy cuticle. This usually bursts or cracks with the natural increment of the tree, and may then be removed in cutaneous flakes, when it presents an appearance not unlike that of prepared oil-paper, and something akin to a similar coating observable on the English birch. The old and decayed portions of the tree assume a cinereous hue, whereby they are easily distinguishable from the younger and more healthy plants. At the proper season, incisions are made in the stem, from which the juice flows forthwith in a copious stream (frequently covering the entire stem) until the wounds are closed by the dessication of the fluid into a gum. In this state the trees glisten in their rich investiture; and, as if vexed at being prevented from pouring forth all their store, the bark distends from the abundance of sap within. After the juice is inspissated and dried by the action of the atmosphere and the sun, it is scraped off the trees and the ground beneath, and collected by the natives, who store it in large loose heaps at particular places on the sea-coast. It is then packed in sheep and goat-skins, each parcel weighing from about twenty-eight to forty pounds, and transported on camels to the great fair held at Berbera, from whence it is either sold and then shipped in native vessels for Aden and other ports on the Arabian coast, or exported to the same places for sale. Sometimes, however, it is purchased by the Banians, and sent directly to the Bombay market in *baggalas*.*

The following are the different kinds of *Lubân* imported for sale into the Aden bazaar.

* *Buggalow* or *Bugalow* (?), an Arab ship employed in carrying on the trade between Bombay, the Malabar coast and the Persia and Arabian Gulfs.—D. H.

1. *Lubân Mattee*, so called from Bunder Mattee the port from whence it comes. This gum is collected chiefly by the Abardagahala tribe of Somalis. The season for piercing the trees, from which it is procured, is during the north-east monsoon in the months of July and August.

2. *Lubân Hunker*, or *Aungure*, from the country of Dour Mahamed and Abardagahala Somalis, is so called from Bunder Aungure whence it is principally exported. Large quantities of this description of frankincense are brought to Aden; when picked and garbled, it sells in the market for $1\frac{1}{2}$ dollars the *maund* of twenty-eight-pounds. Ungarbled, the usual price for the same quantity is three-quarters of a dollar.

3. *Lubân Makur*, from the seaports of Ras Kurree, Khor Bunder, Alholu, Murya and Bunder Khasoom, in the country of the Worsungali and Meggertein tribes of Somalis, who inhabit the extreme north-east coast of Africa about Cape Gardafui. The natives collect this gum in the months of May, June, and July. When picked, it realizes $1\frac{1}{2}$ dollars per *maund*; if not picked, about half that sum. Very little of this quality of gum finds its way to Aden; almost all is taken to Maculla and Sehr on the Arabian coast, from whence it is shipped direct to Bombay.

Lubân Berbera or *Mustika*, so called from the place from which it is exported. It is collected in the district inhabited by the Ayil Yunis and Ayil Hamed Somali tribes, and upwards of 3000 *maunds* are annually sent out of the country. This quality of gum is generally garbled before it is exported, and is largely used by the Arabs in their religious services. Its price in Aden is from three-quarters of a dollar to one dollar per *maund*.

5. Arabian *Lubân*, commonly called *Morbat* or *Shaharree Lubân*. A large quantity of olibanum is also collected in the southern and south-eastern districts of Arabia, and exported from several towns on the coast between Ras Fartak and Marbat. This was the famous thuriferous region which proved the object of such diligent search in ancient times. The country still maintains its renown for the abundance of the drug which it yields and for its superior quality, though its value has sadly depreciated since the time of Pliny, who tells us that those who were employed in garbling it at Alexandria, were hoodwinked to prevent their

coveting the precious gum.* Three *baggalas* are annually freighted from Marbat to Bombay with an entire cargo of the Arabian frankincense, which realizes a higher price in the market than any of the qualities exported from Africa.†

* "They need not to set any keepers for to looke unto those Trees that be cut, for no man will rob from his fellow if he might, so just and true they be in Arabia. But beleve me, at Alexandria where Frankincense is tried, refined, and made for sale, men cannot looke surely ynough to their shops and work-houses, but they will be robbed. The workman that is employed about it, is all naked, save that hee hath a paire of trouses or breeches to cover his shame, and those are sowed up and sealed too, for feare of thrusting any into them. Hoodwinked he is sure ynough for seeing the way too and fro, and hath a thicke coife or maske about his head, for doubt that hee should bestow any in mouth or eares. And when these workmen bee let foorth againe, they be stripped starke naked, as ever they were borne, and sent away. Whereby we may see, that the rigour of justice cannot strike so great feare into our theeves here, and make us so secure to keep our owne, as among the Sabæans, the bare reverence and religion of those woods."—*Pliny's Natural History, Holland's translation, Lond., 1601, tome i., p. 367.*

† Specimens of each of the five kinds of Olibanum above enumerated, have been received from the author:—

No. 1, called *Lubán Mattee*, is very dissimilar to any resin known in England as Olibanum. It is in stalactitic masses, which have evidently been the produce of a very copious flow of the peculiar secretion of the tree. These pieces, whose weight varies from one to three ounces, are in parts white or yellowish, and highly opaque, in other parts brightly transparent. A thin, brown, paper-like bark is occasionally adherent. The *Lubán Mattee* possesses a strong, agreeable, somewhat citron-like odor and but little taste. It is closely allied in its characters to the *Tacamaque jaune huileuse A.* of Guibourt (*Histoire des Drogues*, tome iii., p. 484), which is the *Resina anime* of the German pharmacologists. It comes also very close to the *Tacamaque jaune huileuse B.* of Guibourt, a resin of unknown origin, in scraped pieces, which is sometimes sold in London as *Elemi*. It also nearly approaches, as Professor Guibourt informs me, the *Résine de Madagascar* of his *Histoire des Drogues*, tome iii., p. 480.

No. 3, *Lubán Makur* is Olibanum in separate, opaque, yellowish, rather small tears, to which bark is frequently attached.

Nos. 4 and 5, *Lubán Berbera*, and the Olibanum collected in the southern and south-eastern districts of Arabia, consists of tears closely agglomerated together into darkish masses, many of the tears having a vitreous appearance when fractured.

Of *Lubán Hunkur* (No. 2), a small sample has been received.—D. H.

(To be continued.)

ARTIFICIAL FRUIT ESSENCES.

BY FEHLING.

Pine-Apple Oil is a solution of one part of butyric acid ether, in eight or ten parts of alcohol. For the preparation of this ether, pure butyric acid must be first obtained by the fermentation of sugar, according to the method of Bensch.

"Dissolve 6 lbs. of sugar and half an ounce of tartaric acid, in 26 lbs. of boiling water. Let the solution stand for several days; then add 8 ounces of putrid cheese broken up with 3 lbs. of levigated chalk. The mixture should be kept and stirred daily in a warm place, at the temperature of about 92° Fahr.

"The liquid thus obtained, is mixed with an equal volume of cold water, and 8 lbs. of crystallized carbonate of soda, previously dissolved in water, added. It is then filtered from the precipitated carbonate of lime; the filtrate is to be evaporated down to 10 lbs., when 5½ lbs. of sulphuric acid, previously diluted with an equal weight of water, are to be carefully added. The butyric acid, which separates on the surface of the liquid as a dark-colored oil, is to be removed, and the rest of the liquid distilled; the distillate is now neutralized with carbonate of soda, and the butyric acid separated as before, with sulphuric acid.

"The whole of the crude acid is to be rectified with the addition of an ounce of sulphuric acid to every pound. The distillate is then saturated with fused chloride of calcium, and re-distilled. The product will be about 28 ounces of pure butyric acid."

One pound of this acid is dissolved in one pound of strong alcohol, and mixed with from a quarter to half an ounce of sulphuric acid; the mixture is heated for some minutes, whereby the butyric ether separates as a light stratum. The whole is mixed with half its volume of water, and the upper stratum then removed; the heavy fluid is distilled, by which more butyric ether is obtained. The distillate and the removed oily liquid are shaken with a little water, the lighter portion of the liquid removed, which at last, by being shaken with water and a little soda, is freed from adhering acid.

For the preparation of the essence of pine-apple, one pound of this ether is dissolved in 8 or 10 pounds of alcohol. 20 or 25 drops of this solution is sufficient to give, to one pound of sugar, a

strong taste of pine-apple, if a little citric or tartaric acid has been added.

Pear Oil.—This is an alcoholic solution of acetate of amyloxi-
de, and acetate of ethyloxi-
de. For its preparation, one pound
of glacial acetic acid is added to an equal weight of fusel oil (which
has been prepared by being washed with soda and water, and then
distilled at a temperature between 254° and 284° Fahr.) and
mixed with half a pound of sulphuric acid. The mixture is digested
for some hours at a temperature of 254° , by which means acetate
of amyloxi-
de separates, particularly on the addition of some water.
The crude acetate of amyloxi-
de obtained by separation, and by the
distillation of the liquid to which the water has been added, is
finally purified by being washed with soda and water. 15 parts of
amyloxi-
de are dissolved with half a part of acetic ether in 100 or
120 parts of alcohol. This is the essence of pear, which, when
employed to flavor sugar, to which a little citric acid has been
added, affords the odor of bergamot pears, and a fruity, refreshing
taste.

Apple Oil is an alcoholic solution of valerianate of amyloxi-
de. It is obtained impure, as a bye product, when, for the preparation
of valerianic acid, fusel oil is distilled with bichromate of potash
and sulphuric acid. It is better prepared in the following manner :
—For the preparation of valerianic acid, 1 part of fusel oil is
mixed gradually with 3 parts of sulphuric acid, and 2 parts of water,
added. A solution of $2\frac{1}{4}$ parts of bichromate of potash, with $4\frac{1}{2}$ parts
of water, is heated in a tubulated retort, and into this fluid the
former mixture is gradually poured, so that the ebullition is not too
rapid. The distillate is saturated with carbonate of soda, and
warmed, when a solution of 3 parts of crystallized carbonate of
soda, 2 parts of strong sulphuric acid, diluted with an equal quan-
tity of water, is added. The valerianic acid separates as an oily
stratum.

One part, by weight, of pure fusel oil, is carefully mixed with
an equal weight of sulphuric acid. The cold solution is added to
 $1\frac{1}{4}$ parts of the above valerianic acid; the mixture is warmed for
some minutes (not too long or too much) in a water bath, and then
mixed with a little water, by which means the impure valerianate
of amyloxi-
de separates, which is washed with water and carbonate
of soda. For use as an essence of apples, one part of valerianate

of amyloxyde is dissolved in 6 or 8 parts of alcohol.—*Annals of Pharmacy, for Feb. & Dec. 1852.*

ON A NEW COBALT COLOR.

By M. St. EVIE,

Lecturer at the Faculty of Sciences, Besancon.

When a cold concentrated solution of nitrite of potash is added to a cold concentrated solution of nitrate of cobalt, a disengagement of binoxide of nitrogen takes place, accompanied by the deposition of an insoluble precipitate, of a peculiar yellow color. A considerable quantity of nitrate of potash is found in the supernatant liquor.

This new substance may also be produced by the following method: To the blue subsalt of cobalt, obtained as a precipitate by the addition of potash to a solution of nitrate of cobalt, add a slight excess of nitrite of potash, and allow a small stream of nitric acid to flow in by means of a pipette; in this case, also, a disengagement of binoxide of nitrogen ensues, with the formation of nitre, and the production of a yellow precipitate.

The other method is, first, to add potash in slight excess to a solution of nitrate of cobalt until the rose colored protoxide of cobalt appears, and then to pass through the resulting magma a current of binoxide of nitrogen.

The following are some of the characteristics and properties of this new body:—It is of a light yellow color, answering to the yellow in the chromatic arrangement of M. Chevreul. Its form is that of four-sided prisms terminated by triangular facets; it is insoluble in water, alcohol, and ether; partially soluble in sulphuret of carbon; neutral to litmus paper. Boiling water decomposes it out of contact of the air, with disengagement of binoxide of nitrogen; in contact of the air, vapors of nitric acid are formed at the same time the solution becomes alkaline and acquires a rose color, and the ordinary nitrate of cobalt and nitrate of potash are found in it. Suspended in water, it resists for a long time the action of a current of chlorine, and it is only in heating the mixture that decomposition takes place. Under the same circumstances, it resists equally well the action of the sulphuretted hydrogen, but hydro-

sulphuret of ammonia almost immediately causes the formation of black sulphuret of cobalt. The action of acids on this substance gives rise to a disengagement of suffocating vapors. Calcined in a sealed tube, it changes its tint, which passes to an orange-yellow. At the same time it becomes fused, and water is disengaged, together with the red fumes of hyponitric acid, and the white vapors of nitric acid. The residuum obtained is composed of sesquioxide of cobalt and nitrate of potash.

By operating in a current of nitrogen or dry carbonic acid, there are obtained in addition all the products of binoxide of nitrogen.

Lastly, under the same circumstances, but employing the elevated temperature of a bright charcoal fire to effect the decomposition of this substance, there is obtained, after the removal of carbonic acid by means of potash, and binoxide of nitrogen by sulphate of protoxide of iron, a gaseous residuum, presenting the characteristics of nitrogen.

Analysis gave the following formula for the constitution of this new color, $Az_2 O_8, Cb O, K O, \frac{1}{2} H O$.

It is therefore necessary, as well on account of the presence of water, as the formation of sesquioxide of cobalt by calcination, to double the above formula, which thus becomes $2 (Az_2, O_8, Cb O, K O) H O$ in equivalents.

En résumé, it thus appears that this salt must be considered as a combination of nitric and nitrous acids united to potash, water, and protoxide of cobalt. This is, at least, the most simple description of it, resulting from an examination of its mode of production, &c.

On account of the great beauty of its color, and its capability of resisting the ordinary agents of oxidation and sulphuration, M. St. Evie is of opinion that this color may be successfully employed in painting. Experiments which have been made on this point during the last twelve months, the particulars of which are in the hands of M. Chevreul, tend to show that it may be employed, without undergoing any change, both in oil and water painting. Several artists have used it, and it is very probable that the color will prove an addition to the fine arts.—*Annals of Pharmacy*, Dec. 1852.

RESEARCHES ON PYROXYLINE.

By A. BECHAMP.

We frequently encounter difficulties, in preparing soluble pyroxyline. In obtaining that employed by me, I followed the process of MM. Gaudin and Mialhe. I have ascertained that if the mixture of sulphuric acid and nitre be cooled previously to the immersion of the cotton, the pyroxyline obtained is strongly fulminating, but insoluble in ether. On recommencing the same operation with the same materials, but at the temperature naturally developed by the reaction, the product obtained was both fulminating and soluble. Again, the insoluble pyroxyline formed in the first operation became soluble after being immersed in the hot mixture of the acid and nitrate.

The condition necessary for constantly obtaining soluble pyroxyline is therefore to operate whilst the mixture is hot.

When a stream of ammoniacal gas is passed, for at least half an hour, through a solution of 2 parts of pyroxyline in 30 parts of alcohol of spec. grav. 0.845, the viscous solution becomes perfectly fluid.

In this ammoniacal solution, sulphuretted hydrogen gas produces a yellow precipitate, which is insoluble in alcohol of spec. grav. 0.833. This precipitate is complex; it contains a portion which is, and another which is not soluble in water. According to some of its reactions, I thought it like a sulphuretted compound.

When the ammoniacal solution is poured suddenly into 15 or 20 times its volume of water, a white powder, completely insoluble in water, is precipitated; it is not altered by remaining for forty-eight hours in water. Its properties are as follows:—

Dried at 68° F. *in vacuo* over sulphuric acid, it is very persistent. It is light, inodorous and tasteless. It becomes electric by friction. Heated in a tube, it does not fulminate so soon as pyroxyline; it evolves nitrous vapors, and leaves a residue of carbon. Heated with fuming muriatic acid, it is gradually dissolved, disengaging chlorine in abundance. Concentrated sulphuric acid dissolves it, without apparent disengagement of gas. The nitro-sulphuric mixture does not appear to produce any change in it. I have not yet ascertained whether or not the pyroxyline was regenerated.

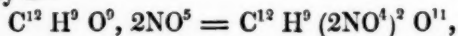
The water in which the precipitation takes place contains nitrate of ammonia, but very little organic matter. This fact deserves attention. The elementary analysis shows, in fact, that the new combination only differs from pyroxyline by containing 1 equiv. less nitric acid.

I have ascertained that the new substance is constant in its composition. I have analysed the product immediately after its precipitation, and also after forty-eight hours' contact with water. The composition did not vary.

In six analyses for the determination of the carbon and hydrogen, and three others in which I determined the nitrogen by the process of M. Dumas, I obtained concordant results; the average of the four elements is in hundredths,—carbon, 28·216; hydrogen, 3·575; nitrogen, 10·777; oxygen, 57·432. The substance had been dried at 212° F. Taking into consideration the formation of nitrate of ammonia in the reaction, and admitting the formula attributed to pyroxyline by M. Pelouze, (*Comptes Rendus*, xxiv. p. 2,) namely, $C^{24} H^7 O^{17} 5NO^5$, the substance examined by me would be formed according to the equation—

$C^{24} H^{17} O^{17}, 5NO^5 + NH^3 + HO = NO^5, NH^4 O + C^{24} H^{17} O^{17}, 4NO^5$.
If we take this last formula for that of the new compound, its theoretical centesimal composition is,—carbon, 28·070; hydrogen, 3·315; nitrogen, 10·916; oxygen, 57·699.

Between 68° and 212° F., 100 parts of the substance lost, by the average of two determinations, 1·727 of water. This number supposing $H = 1$, represents 9·015 of water for the quantity of substance expressed by the formula $C^{24} H^{17} O^{17}, 4NO^5$, that is to say, 1 equiv. of water. The formula of the new substance, at the temperature of 68° F., is therefore $C^{24} H^{17} O^{17}, 4NO^5, HO$, or, dividing it by 2—



that is to say, the formula of cane-sugar, in which $2NO^4$ takes the place of $2H$.

Conclusion.—Several formulæ are attributed to pyroxyline. The new compound, by its composition as well as by the circumstances of its formation, confirms the formula of M. Pelouze.

The following is the molecular formula which I propose for pyroxyline:— $C^{24} H^{17} X^4 O^{21}, NO^{5*}$;



that of the new compound, dried at 68° F., being $C^{24} H^{17} X^4 O^{21}$, HO; and that of the same, dried at 212° F., $C^{24} H^{17} X^4 O^{21}$.

I have already commenced some experiments on the nitrated products insoluble in water which results from the action of the nitro-sulphuric mixture on glucose, dextrine, gum, &c.—*Comptes Rendus*, Oct. 4, 1852, p. 473, from *Chemical Gazette*, Nov. 15 1852.

ON THE CHEMICAL COMPOSITION OF QUINIDINE.

By H. G. LEERS.

Quinidine, discovered several years ago by Dr. Winckler, in a bark resembling Huamalies cinchona, and also in Maracaibo cinchona, has never yet been subjected to an accurate analysis, although this base appears to be daily acquiring a greater importance in relation to quinine.

In consequence of the government of Bolivia having monopolized the exportation, and by this means raised the price of *Calisaya cinchona*, (the principal material for the manufacture of quinine,) a cheaper bark is now imported under the name of Bogota cinchona,* which contains chiefly quinidine, and but a small proportion of quinine.†

From this Bogota cinchona, large quantities of quinidine are now prepared for admixture with quinine. The proportion of alkaloids in this bark was, in two experiments, 2.61 and 2.66 per cent. It appeared, therefore, of great interest, to obtain a more exact knowledge of the chemical relations of this substance, which, in the crude state in which the author received it from Mr. Zimmer, was beautifully white and distinctly crystallized, but still not perfectly pure. It contained an uncrystallizable, yellow-

[* The bark here called *Bogota cinchona* is usually known in England as a Carthagena bark; and to distinguish it from the common hard Carthagena bark, it is sometimes called *fibrous Carthagena bark*. Coquetta bark is one sort of this bark.—*Ed. Pharm. Journ.*]

† In order to ascertain whether Bogota cinchona, like other cinchona barks, contained kinic acid, some finely powdered Bogota bark was boiled with hydrate of lime, and the obtained kinate of lime submitted, along with peroxide of manganese and sulphuric acid, to distillation, by which was obtained a liquid containing kinone.

ish-green resinous substance, together with quinine, (according to the test with chlorine water and ammonia,) and very probably, also, a third substance, containing a larger proportion of carbon.

The following operations were performed in the laboratory of Prof. Will :

In order to obtain the base in a perfectly pure state, the rough quinidine was dissolved in alcohol of 90 per cent., and the solution allowed to evaporate spontaneously in the air, when a greenish-yellowish resinous substance soon appeared on the walls of the vessel. The most beautifully formed crystals were then selected, washed with alcohol, and re-dissolved in spirit of wine, when the same greenish-yellow substance was deposited. The re-crystallization having been performed five or six times, until the yellow substance was no longer perceived, and the proportion of carbon in the base not yet proving uniform, the crystals obtained after five or six times repeated re-crystallization were finely powdered and shaken with ether, until all reaction of quinine disappeared, and the proportion of carbon remained constant.

If quinidine be dissolved in spirit of wine of 90 per cent., and the solution left to spontaneous evaporation, it forms colorless, hard prisms, shining like glass, with edge angles of 86° and 94° ; the planes of the prisms are strongly striped, these stripes being also observable on the planes of truncation of the more obtuse edges of the prism; and in the direction of the latter planes the crystals admit of perfect cleavage. The crystals are terminated by shining planes, which converge at $114^{\circ} 30'$, and are applied on the more acute edges of the prism.

The rather hard crystals are easily rubbed to a snow-white powder, which becomes electrical by friction. If the crystals be heated in a platinum crucible over the flame of spirit of wine, they at first retain their brilliancy and form, and fuse without decomposition, and without yielding water, at 175° C.,* and form a clear, wine-yellow liquid, which, when cold, solidifies into a greyish-white crystalline mass. If the heat be increased above 175° , the wine-yellow fluid ignites, burns with a red, vividly flaring, strongly sooty flame, evolving at the same time an odor

*[All the temperatures expressed in this paper are according to the centigrade scale.—Ed.]

of kinoyl and of oil of bitter almonds, and leaves behind a voluminous, easily combustible charcoal. The taste of quinidine is not so intensely bitter as that of quinine.

In order to determine its solubility, quinidine was rubbed down with water of 17° C., and shaken. 36.1 grammes of the solution left, after evaporation, 0.014 grams. of quinidine, dried at 100°; one part of quinidine, therefore was soluble in 2580 parts of water at 17°.

42.7 grms. of pure quinidine dissolved in water at 100°, and treated as before, left 0.023 grms. of quinidine = 1 part to 1858 parts of water at 100° C.

The solubility in ether was determined by shaking finely powdered pure quinidine with ether of 0.728 spec. grav. at 17°; 19.4 grms. of this solution, by evaporation yielded 0.137 grms. of quinidine dried at 100°, or 100 parts of the solution contain 0.70 of quinidine. According to Winkler, 100 parts of ether dissolve 0.592 parts of quinidine. One part of quinidine dissolves in 12 parts of alcohol of 0.835 spec. grav. at 17°.

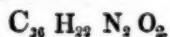
Analysis of Quinidine.—1. *Crude quinidine* finely powdered and dried at 100° until it lost nothing, yielded :

	I.	II.
Carbon, . . .	77.34	77.02
Hydrogen, . . .	7.86	7.90

2. *Pure Quinidine*, obtained by being four or five times re-crystallized from alcohol, finely triturated and shaken five or six times with ether, till chlorine water and ammonia produced no reaction of quinine, was washed with water and dried at 110°, till the weight remained constant. The results were :

	I.	II.	III.	IV.	V.	VI.	VII.
Carbon, . . .	76.88	76.82	76.79	76.40	76.55	76.49	—
Hydrogen, . . .	7.70	7.76	7.77	7.73	7.70	7.81	—
Nitrogen, . . .	—	—	—	—	—	—	9.99

With reference to the analysis of the salts of quinidine, and the determination of the atomic weight of the base from the proportion of platinum in the platinum double salt, the following formula is calculated for quinidine :



		Calculated.		Average of the Experiments.	
36 equiv.	Carbon, . . .	216 . . .	76.59 . . .	76.66	
22 "	Hydrogen, . .	22 . . .	7.80 . . .	7.74	
2 "	Nitrogen, . .	28 . . .	9.93 . . .	9.99	
2 "	Oxygen, . . .	16 . . .	5.68 . . .	—	
1 "	Quinidine, =	282 . . .	100.000		

If quinidine be subjected with hydrate of potash and a small quantity of water to distillation, a yellow oleaginous substance is obtained, which reacts as an alkali, and possesses all the properties of quinoline. Repeatedly washed with distilled water, it yielded a beautifully yellow oily liquid, from which muriatic acid and chloride of platinum threw down an orange-yellow precipitate, which, after having been perfectly exhausted by cold water, was dissolved in hot water. When cold, the platinum salt precipitated from the solution in the form of small orange-red needles. Dried at 110° , 0.695 grms. of the platinum salt yielded, after being burnt, 0.204 grms. of platinum = 29.35 per cent. If the formula for quinoline, $C_{10}H_7N$, be correct, that of the platinum salt of quinidine would be $C_{18}H_7N, HClPl.Cl_2$, and the salt would contain 29.47 per cent. of platinum.

Finely powdered quinidine dissolves in chlorine water without any particular phenomenon; quinine and cinchonine have the same relation to chlorine water. But if ammonia be added to these solutions, the cinchonine falls down from the cinchonine solution of a white color, the quinine solution becomes green like grass, and the quinidine solution remains unaltered. The reaction upon quinine becomes still more sensible by ether, if the substance to be tested for quinine be first finely powdered, then shaken with ether, and to the ether, chlorine water and ammonia be added, the least trace of quinine may be detected by the liquid becoming green. By this test, the absence or presence of quinine could very easily be detected in the preparation of the quinidine salts.

Salts of Quinidine.—Most of these salts are much more readily soluble in water than the salts of quinine. In spirit of wine they dissolve very easily, in ether scarcely at all. There are acid and neutral salts of quinidine, of which there are but

few which are not distinctly crystallizable; some furnish beautiful large crystals with a vitreous brilliancy. The aqueous solutions of the quinidine salts yield with potash, soda and ammonia, the mono- and the bicarbonates of the alkalis, white pulverulent precipitates, which crystallize after long standing, and are insoluble in an excess of the precipitant.

Phosphate of soda, bichloride of mercury, and nitrate of silver, yield white precipitates. Chloride of gold gives a light yellow, chloride of platinum an orange-yellow, and chloride of palladium a brown precipitate. Sulphocyanide of ammonium yields a white and tannic acid, a dirty yellow color, with the salts of quinidine.

Neutral Sulphate of Quinidine.—This salt was prepared by dissolving quinidine in diluted sulphuric acid, till the latter was neutralized. The neutral solution having been evaporated in the water-bath, yielded by cooling long silky shining acicular crystals, arranged in star-like groups, of sulphate of quinidine, the watery solution of which was neutral. In order to establish the solubility of this salt, the crystals were rubbed down with water of 17° , and then some time shaken. The perfectly saturated solution was afterwards filtered, 43.1 grms. of the filtrate were evaporated to dryness, and the residue dried at 110° , the result was 0.325 grms. of sulphate of quinidine. It required, therefore, 130 parts of water at 17° to dissolve one part of the sulphate.

33.5 grms, of a solution saturated at 100° , yielded, after being evaporated and dried at 100° , 1.904 grms. of the salt = one part of the salt in 16 parts of water. Sulphate of quinidine dissolves very readily in alcohol, but is almost insoluble in ether. Analysis of 100 parts :

	Found.				Average.	Calculated.
	I.	II.	III.	IV.		
Carbon, . .	64.70	64.79	—	—	64.75	65.25
Hydrogen, .	7.18	6.91	—	—	7.05	6.95
Sulphuric acid, —	—	—	11.99	12.02	12.01	12.08

Corresponding formula: $C_{36} H_{22} N_2 O_2 SO_3 HO$.

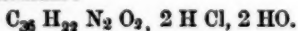
Acid Sulphate of Quinidine.—The salt was obtained by adding to the neutral sulphate as much acid as it already contained

The clear, very acid, and strongly opalizing solution was evaporated in the water-bath, and then placed under the air-pump, over sulphuric acid. After the solution had arrived at the consistency of a syrup, and had assumed an intensely brown color, a crystalline mass of rather thick asbestos-like needles of a slight yellow color was formed. These crystals, after being removed from the mother-liquor, were washed with a mixture of alcohol and ether, and pressed between folds of filtering-paper, which did not deprive them of their yellow color. The proportion of sulphuric acid in the salt varied considerably several times, which arose very likely from the presence of some neutral sulphate, and for this reason no analysis is given.

Neutral Hydrochlorate of Quinidine.—Pure quinidine was finely powdered and mixed with water, then as much muriatic acid added by drops with the addition of heat, till the whole of the quinidine was dissolved, and the solution was neutral to test-paper. By the spontaneous evaporation of the solution the muriate of quinidine was obtained in the form of large rhombic prisms of a vitreous lustre. The mother liquor yielded no crystals, even after having been evaporated to the consistency of a syrup and left standing for several weeks in the dry air. The solubility was determined by rubbing down the crystallized salt with water at 17°, and shaking, till the latter took up no more salt. Of the filtered liquid 7.067 grms. were evaporated, and the residue dried at 100°, weighed 0.252, = 1 part of the salt, therefore, required 27 parts of water. Alcohol dissolves the salt very easily, ether scarcely at all. Analysis showed in 100 parts:

	Found.								Calculated.
	I.	II.	III.	IV.					
Carbon, . .	64.57	64.11	—	—	...	...	...	64.19	
Hydrogen, .	7.28	7.06	—	—	...	...	...	7.13	
Chlorine, .	—	—	9.95	10.16	...	...	...	10.25	

Corresponding formula:



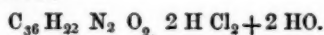
Acid Hydrochlorate of Quinidine.—To the last salt as much muriatic acid as it already contained was added, and the solution, left to evaporate spontaneously, yielded beautiful, large, slightly

yellowish crystals, which are monoklinometric, and have the appearance of rhombic prisms.

Perfectly dried over sulphuric acid at 100° , the acid muriate of quinidine lost 5.8 per cent. of water. It is easily soluble both in water and spirit of wine. In 100 parts were:

	Found.			Calculated.
	I.	II.	III.	
Carbon . . .	58.30 . . .	— . . .	— . . .	57.93
Hydrogen, . .	7.12 . . .	— . . .	— . . .	6.97
Chlorine, . .	— . . .	18.96 . . .	19.00 . . .	18.99

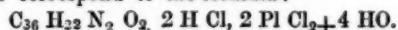
Corresponding formula:



Platinum-Chloride of Quinidine.—The most beautiful crystals of the muriate of quinidine were dissolved in water, the solution diluted, acidulated with muriatic acid, and chloride of platinum added as long as a precipitate was obtained. The orange-yellow precipitate was then placed on a filter and washed with acidulated water till chloride of platinum was no longer detected in the washings. The precipitate dried at 100° , was burnt, and gave the following results. In 100 parts were:

	Found.			Average of experiments calculated.	
	I.	II.	III.		
Platinum, . .	27.05 . .	27.17 . .	27.13 . .	27.11	27.04

These numbers correspond to the formula:

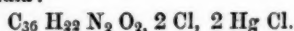


Mercury-chloride of Quinidine.—Pure quinidine was dissolved by the aid of heat in alcohol of 85 per cent., acidulated with muriatic acid and an equal weight of bichloride of mercury dissolved in ether, added to the solution. When the mixture had become cold, the mercury-chloride of quinidine was obtained in the form of small scaly pearly crystals, which dissolved with great difficulty in water. The crystals were placed on a filter, thoroughly washed and pressed between folds of filtering-paper; when dried over sulphuric acid they lost no water at 110° .

In 100 parts were:

	Found.					Calculated.
	I.	II.	III.	IV.	V.	
Carbon,	34.77	.. — ..	— ..	— ..	— ..	34.52
Hydrogen,	4.01	.. — ..	— ..	— ..	— ..	3.38
Quicksilver,	—	.. 31.98 ..	31.91 ..	— ..	— ..	31.97
Chlorine,	—	.. — ..	— ..	22.60 ..	22.31 ..	22.63

Corresponding formula :



Nitrate of Quinidine.—If pure quinidine be dissolved by the aid of heat in moderately diluted nitric acid until the solution is neutral to test-paper, and the strongly opalizing mixture evaporated over sulphuric acid, the nitrate of quinidine crystallizes after some time in beautiful large warty crusts, resembling enamel. If the mother liquor be allowed further to evaporate, a hemispherical white mass, resembling wax, forms on the surface, whilst the liquid becomes slightly green. This salt readily dissolves in water.

Chlorate of Quinidine.—By the mutual decomposition of neutral sulphate of quinidine and chlorate of potash, this salt was obtained in a perfectly pure state after having been recrystallized from alcohol of 90 per cent. It forms long, white silky prisms grouped in tufts. By a gentle heat it fuses into a transparent mass, but explodes very violently at a higher temperature.

Hyposulphite of Quinidine.—It was obtained by the mutual decomposition of neutral sulphate of quinidine and hyposulphite of soda. When the solution cools, the hyposulphite of quinidine crystallizes in thin, long, asbestos-like needles. In water this salt dissolves with some difficulty, but is very soluble in ether.

Fluate of Quinidine.—Pure quinidine in fine powder was suspended in water and placed in an apparatus for the development of fluorid acid; after some time, the quinidine contained in the water entirely dissolved, and a clear, intensely acid, slightly opalizing liquid was obtained. The solution was left to spontaneous evaporation, and yielded a mass of fluat of quinidine, consisting of white, silk-like crystalline needles, which dissolved with great readiness in water. Upon the addition of chloride of calcium a precipitate was formed, which was insoluble in acetic acid.

Acetate of Quinine.—This compound is obtained by dissolving

by the aid of heat, finely powdered quinidine in acetic acid. When cold, the acetate of quinidine appears in the form of thin, long silky needles, which do not easily dissolve in cold water. When dried, the salt easily loses part of its acid. On removing the first crystals, and allowing the mother-liquor to evaporate spontaneously, a salt crystallizes from it, consisting of a mass of semi-globularly grouped, small pointed needles, having an appearance of porcelain. This salt is by far more soluble in water than that above mentioned.

Oxalate of Quinidine.—If an alcoholic solution of oxalic acid be added to an alcoholic solution of quinidine with the application of heat, till the liquid is neutral to test-paper, the oxalate of quinidine crystallizes from the solution after the latter has become cold, in the form of long, white, silky needles, which dissolve with great difficulty in water. From the spontaneously evaporated mother-liquor a salt in the shape of warty crusts, with an opaque white appearance, crystallizes, which dissolves with less difficulty in water.

Tartrate of Quinidine.—With tartaric acid quinidine forms two compounds, which appear to possess great resemblance to the oxalates. On saturating tartaric acid with quinidine, at a boiling heat, a salt separates, when the solution cools, in the shape of small pearly needles, which dissolve, but with great difficulty, in water. The solution of neutral tartrate of quinidine having been allowed to evaporate spontaneously, yielded beautiful vitreous needles, and, by the further evaporation of the mother-liquor, small, semi-globular, white, opaque shining crusts of small needles appeared.

Citrate of Quinidine was obtained by saturating pure quinidine with pure citric acid at a boiling heat. From the cold neutral solution of the citrate of quinidine, small, but slightly glittering needles crystallized, which did not easily dissolve in water.

Formate of Quinidine, obtained by saturating the pure aqueous formic acid with quinidine. The salt forms long, beautiful, silky needles, readily dissolving in water.

Butyrate of Quinidine.—Aqueous butyric acid was saturated with an alcoholic solution of quinidine. The salt crystallized from the neutral solution in large warty crusts resembling

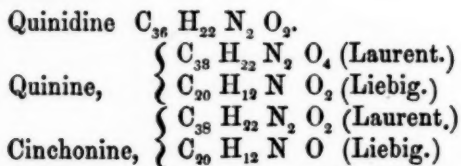
porcelain. It is very soluble, and smelt strongly of butyric acid.

Valerianate of Quinidine.—Aqueous valerianic acid being saturated with an alcoholic solution of quinidine, and the neutral solution left to spontaneous evaporation, the salt soon appeared in the shape of warty crusts, in the centre of which was a lighter body of radiating structure. The salt smelt strongly of valerianic acid. The solution of the valerianate of quinidine having been evaporated in the water-bath, the liquid assumed a brown color, emitting a penetrating odor of valerianic acid, whilst at the same time oily drops were evolved.

Kinate of Quinidine.—Pure kinic acid, dissolved in water, was saturated whilst heated with quinidine. The spontaneously evaporated neutral solution yielded a white milky mass of small needles, soluble both in water and spirit of wine.

Hippurate of Quinidine.—Pure hippuric acid, dissolved in spirit of wine, was saturated with quinidine under the application of heat. The hippurate of quinidine crystallized from the cold neutral solution in long silky crystals, which had the appearance and shape of fern leaves. It dissolves readily in water and in spirit of wine.

In comparing the following formula for quinidine with those for quinine and cinchonine, the following relations are established :



According to this, quinidine differs from cinchonine by a lesser proportion of two atoms of carbon, whilst the equivalents of the other elements are the same. An homologous relation between these bases, which appears so very probable, cannot, therefore, be established.—*Lon. Pharm. Jour.* Dec. 1852, from *Ann. der Chem. u. Pharm., Mai, 1852.*

NOTE ON THE PREPARATION OF LIQUID GLUE.

By M. S. DUMOULIN.

All chemists are aware, that when a solution of glue (gelatine) is heated and cooled several times in contact with the air, it loses the property of forming a jelly. M. Gmelin observed, that a solution of isinglass, enclosed in a sealed glass tube and kept in a state of ebullition on the water-bath for several days, presented the same phenomenon, that is to say, the glue remained fluid, and did not form a jelly.

The change thus produced is one of the problems most difficult of solution in organic chemistry. It may be supposed, however, that in the alteration which the glue undergoes, the oxygen of the air or of the water plays a principal part; what leads me to think this is the effect produced upon glue by a small quantity of nitric acid. It is well known, that by treating gelatine with an excess of this acid, it is converted by heat into malic and oxalic acids, fatty matter, tannin, &c. But it is not thus when this glue is treated with its weight of water and with a small quantity of nitric acid; by this means a glue is obtained which preserves nearly all its primitive qualities, but which has no longer the power of forming a jelly. Upon this process, which I communicated, is founded the Parisian manufacture of the glue which is sold in France under the title of "*colle liquide et inaltérable*."

This glue being very convenient for cabinet-makers, joiners, pasteboard-workers, toy makers, and others, as it is applied cold, I think it my duty, in order to increase its manufacture, to publish the process.

It consists in taking 1 kilogram. [2 and 1-5th lbs.] of glue, and dissolving it in 1 litre [2 and 1-9th pts.] of water in a glazed pot over a gentle fire, or what is better, in the water-bath, stirring it from time to time. When all the glue is melted, 200 grms. [7 oz. Av.] of nitric acid (spec. grav. 1.32) are to be poured in, in small quantities at a time. This addition produces an effervescence, owing to the disengagement of hyponitrous acid. When all the acid is added, the vessel is to be taken from the fire, and left to cool.

I have kept the glue, thus prepared, in an open vessel during more than two years, without its undergoing any change. It is very convenient in chemical operations; I use it with advantage

in my laboratory for the preservation of various gases, by covering strips of linen with it.—*Chemical Gazette*, Dec. 1st, from *Comptes Rendus*, Sept. 27th, 1852.

STRYCHNINE IN BRITISH BEER, PALE ALE, ETC.

Some time since, in a lecture delivered by M. Payen, at Paris, he is asserted to have stated that strychnine was prepared in large quantities in Paris, and that the French authorities had ascertained that it was destined for England, it being employed in the manufacture of the celebrated bitter beer of that country.

This statement was copied into the *Times* newspaper, and thus became universally disseminated. It was met with a decided and indignant denial on the part of the manufacturers. They invited and obtained the services of eminent analytic chemists (Professor Graham, of University College, and Professor Hoffman, of the Royal College of Chemistry,) who deny unequivocally the presence of the poison in even the smallest possible quantity. Their observations, and the mode of analysis pursued, are worthy of attention.

Strychnine, the alleged (in this instance) substitute for hop, is a fine crystallizable substance, extracted from *nux vomica*, and belongs to the class of vegetable alkaloids. Although a valuable medicine in minute doses, still, it is remarkable for its energy as a poison, and for the intense bitterness of its taste. Half a grain would poison a person, and the bitterness of the same minute quantity is perceptible in every drop of six or eight gallons of water in which it is dissolved.

“It may be stated, at once, that the quantity of strychnine which we find necessary to impart to beer the degree of bitterness possessed by pale ales, is, for a gallon of beer, one grain of strychnine, or double the fatal dose. The price of strychnine is about 16s. the ounce, which does not amount to so much as one penny per grain. Estimating the annual production of pale ale in Burton at 200,000 barrels, the strychnine required as a bitter would, however, amount to 16,448 ounces, and cost £13,158, while nobody believes that so much as 1000 ounces of strychnine are annually manufactured over the whole world. The bitterness obtained by means of strychnine is equal in degree to that of the

hop, but very different in kind, and easily distinguished when the two bitters are compared. The bitter of the hop is immediate in its action upon the palate, is accompanied by a fragrant aroma, and soon passes off; while that of strychnine is not so instantaneous; but when the impression is once communicated it is more lasting, and becomes, from its persistence, like that of a metallic salt. The bitter of strychnine is, indeed, easily distinguishable from that of the hop when deliberately tasted."

"Still, it would be highly desirable to be able to identify strychnine in beer by the actual extraction of the substance, and the application to it of a chemical test of absolute certainty. Fortunately, those poisons which have the most violent action upon the animal economy, possess often, also, the best marked reactions, or their physiological and chemical properties are equally salient. Thus arsenic and hydrocyanic acid are the most easily detected of chemical substances, and strychnine proves to be not far behind them in this respect.

"A quantity of strychnine, not exceeding one-thousandth part of a grain, is tested and recognized to be strychnine in the following manner: The powder is moistened with a single drop of undiluted sulphuric acid, and a small fragment of chromate of potass placed in the liquid. A beautiful and most intense violet tint immediately appears at the points of contact, and is speedily diffused over the whole liquid. Although most intense, the color disappears entirely again in a few minutes. The admixture of the smallest quantity of organic matter, however, interferes with the success of the process. In order to apply the test in operating upon a complex liquor like beer, the strychnine must first be extracted from the liquid, and obtained in a pure, or nearly pure, state. This difficulty, which appears at first considerable, may be readily surmounted, and the strychnine, if it really exists in beer, be separated, and its nature established in the most certain manner.

"For this purpose, two ounces of ivory black, or animal charcoal, were shaken in half a gallon of beer, to which half a grain of strychnine had been purposely added. After standing over night, the liquid was found to be nearly deprived of all bitterness, the strychnine being absorbed by the charcoal. The liquid was now passed through a paper filter, upon which the charcoal containing the strychnine was collected and drained.

"The next step was to separate the charcoal from the strychnine. This was readily effected by boiling the mixture for half an hour in eight ounces of ordinary spirits of wine, avoiding loss of alcohol by evaporation. The spirits, which now contained the strychnine, were next filtered, and afterwards submitted to distillation. A watery fluid remained behind, holding the strychnine in solution, but not sufficiently pure for the test. The final purification was accomplished by adding a few drops of potass to the watery fluid, and then shaking it with an ounce of ether. A portion of the ethereal solution evaporated upon a watch-glass left a whitish solid matter of intense bitterness, and this was recognized to be strychnine, by giving the violet tint previously described, upon the application to it of sulphuric acid and chromate of potash."

Having thus satisfied themselves by repeated experiments on beer to which strychnine had been added, of the efficiency of the test, Drs. Graham and Hoffman proceeded to the analysis of a large number of samples of pale ale, taken indiscriminately from the supplies of some twenty manufacturers. *Not one of the varieties of beer, when tested with the greatest scrupulousness, gave the slightest evidence of the presence of strychnine.*—*Medical Times and Gazette, May, 1852, through Hay's Journal, Oct. 1852.*

PREPARATIONS OF MANGANESE AND IRON.

M. BURIN-DUBUISSON of Lyons, who prepared most of the ferro-manganic combinations used by M. Pétrequin, has published an interesting *brochure*, in which he gives the necessary details relating to the subject. The following formulæ are extracted from it.

Powder for Effervescing Solution of Manganese and Iron.—Take of coarsely powdered bicarbonate of soda 20 parts; tartaric acid 25 parts; powdered sugar 53 parts; finely powdered sulphate of iron $1\frac{1}{2}$ part; finely powdered sulphate of manganese, $\frac{3}{4}$ part: mix carefully, and keep in well stopped bottles. A teaspoonful is mixed with each glass of wine and water drunk during meal-time.

Pills of Carbonate of Iron and Manganese.—Take of pure crystallized sulphate of iron 75 parts; pure crystallized sulphate

of manganese 25 parts; crystallized carbonate of soda 120 parts; honey 60 parts; water a sufficient quantity. Pills of 20 centigrammes (3 grains) are made; they keep easily, without becoming oxidized, in well-closed vessels. From two to four are given daily.

Ferro-manganic Chocolate.—One part of carbonate of iron and manganese is first mixed with four of sugar, and divided into large lozenges; of these, 100 parts (grammes) are mixed with 500 of chocolate paste, in the preparation of which 100 parts of sugar have been left out. This will make 800 lozenges, each of which contains about 3 centigrammes (nearly half a grain) of carbonate of iron and manganese. The chocolate decomposes the hydrated carbonate of manganese and iron of the saccharate into hydrated sesquioxide of iron and manganese; there is no metallic taste.

Syrup of Lactate of Iron and Manganese.—Take of lactate of iron and manganese 4 parts; powdered sugar 16 parts; rub together, and add of distilled water 200 parts; dissolve rapidly, and pour into a matras over a water-bath, containing 384 parts of broken sugar: filter the solution. This syrup contains about 15 parts of lactate of iron and 5 of lactate of manganese in 3000 parts. One or two spoonfuls are taken daily.

Lozenges of Lactate of Iron and Manganese are made by adding 20 parts of the lactate to 400 of fine sugar, with a sufficient quantity of water. The mass will make 840 lozenges; of which six or eight are taken daily.

Syrup of Iodide of Iron and Manganese.—M. Burin-Dubuisson forms a solution of iodide of iron and manganese, in the proportion of one part by weight to two of water: the proportion of the salts is about three of iodide of iron to one of iodide of manganese. Six parts of this are mixed with 294 of simple syrup; of this, M. Pétrequin gives one or two spoonfuls daily.

Pills of Iodide of Iron and Manganese.—Take of the officinal solution prepared by M. Burin-Dubuisson, 16 parts (grammes;) honey 5 parts; some absorbent powder $9\frac{1}{2}$ parts. Divide into 100 pills. The honey and the solution are first mixed, and evaporated at first rapidly, then more slowly, to 10 parts. Then add the powder, and divide the mass into four parts, which must be rolled in powder of iron reduced by hydrogen; each of these

must then be divided on an iron plate into 25 pills, and again rolled in the iron powder. Finally, they are covered with a layer of tolu, according to M. Blancard's process.

All these preparations must be made very carefully. M. Burin-Dubuisson has ascertained that the commercial salts of manganese frequently contain copper, and even arsenic; he hence insists on the necessity of calcining the sulphate of manganese, twice, or more frequently, at a dark red heat, and of carefully testing the solution.—*Amer. Jour. Med. Sci.*, Oct. 1852. from *Bul. de Thérap.*

ON A GREEN COLORING MATTER FROM CHINA.

By J. PERSOZ.

M. Daniel Kœchlin-Schone forwarded to me, last autumn, a sample of calico dyed in China, of a sea-green tint of great stability, requesting me to examine into the composition of this green color. All the attempts to ascertain the presence of either a yellow or blue, which I made with this specimen, met with no success; and I was soon convinced, by isolating the coloring matter, that this green was produced by a tinctorial substance *sui generis*. It also became evident—

1. That this coloring matter was of a vegetable origin.

2. That the stuff upon which it was fixed was charged with a large quantity of alumina and with a little oxide of iron and lime, substances the presence of which necessarily implied that the coloring matter employed had required the assistance of mordants to make it adhere to the stuff.

These results, so positive, and yet so contrary, not only to all we know in Europe with regard to the composition of greens, but also to all that has been written on the processes employed by the Chinese in dyeing this color, necessitated a closer examination on my part. I therefore had recourse to the assistance of Mr. Forbes, American Consul at Canton, to obtain a specimen of the substance. He had the goodness to send me about 1 grm. of it.

This substance is, in thin plates, of a blue color, resembling that of Javanese indigo, but of a finer grain, and differing also from indigo in its composition and all its chemical properties. On

infusing a very small fragment of it in water, this fluid soon acquired a deep blue color with a greenish tinge. On gradually bringing the liquid to boil, and immersing in it a piece of calico on which mordants of iron and alumina had been printed, a genuine dyeing took place, the portions of the stuff which were coated with alumina acquiring a sea-green color of greater or less intensity according to the strength of the mordant, those which were coated with alumina and oxide of iron becoming deep sea-green with an olive tinge, and those charged with pure oxide of iron dark olive. The portions of the calico not coated with mordant remained white.

The colors thus obtained were exposed to all the agents to which the Chinese green had previously been submitted, and behaved in the same manner. From these experiments we may conclude—

1. That the Chinese possess a coloring matter, having the appearance of indigo, which communicates a green color to mordants of alumina and iron.

2. That this coloring matter neither contains indigo nor any derivative of this dyeing principle.—*Chemical Gazette, from Comptes Rendus, Oct. 1852.*

Varieties.

Meeting of German Naturalists at Wiesbaden.—The following notice is from the London Athenæum, 1852, No. 1301, through Silliman's Journal for January, 1853. This Society, the prototype of the British Association, has just held its twenty-ninth Annual Meeting in the flourishing little town of Nassau; which was well calculated, as well from the extent of its public buildings, and their adaptation to scientific *réunions* and social purposes, as also from the geological interest and natural beauties of the surrounding country, for the accommodation and entertainment of so numerous a body of scientific strangers. A correspondent, who was present, furnished a summary to the "Athenæum," from which the following is extracted.

On the 17th of September the members began to pour into the town from all quarters of Germany; each railway train bringing its own quota of these welcome visitors, in honor of whose approach, the hotels and many of the public buildings and private houses were decked out with the national flag, waving from the doorways and roofs.

To be a privileged member of this Association, with the right of speaking and voting in the meetings, it is necessary to have written some work bearing on natural history, physics, or medicine; but to become a temporary

associate, with the right of being present as a listener merely, at all the scientific meetings, as well as of taking part in all the festive social *réunions*, is free to every one on the very moderate payment of two Russian dollars—equivalent to a dollar and a-half of our money. Hence, when the annual meeting takes place in a town like this, numbers of the middle and upper classes of inhabitants eagerly join it, as well as all scientific strangers who may happen to be in the neighborhood. The objects of the Society, like those of the British Association, are, the formation of a mutual acquaintance between the scientific men of Germany, and the facilitation of an early interchange of their ideas in reference to all new discoveries. The numbers who this year took part in the matter amounted to nearly eight hundred. Of the Germans present there were considerably more than a hundred names honorably known in the records of science, and among the foremost may be named the octogenarian Von Buch, Prof. Rose, the great analytic chemist, Von Carnall, Inspector of Mines from Berlin, Prof. Haidinger, Director of the Imperial Geological Institute, from Vienna, Nees Von Esenbeck, the great systematic botanist, Wöhler and Weber from Göttingen, Forchhammer of Stuttgart, Lehman of Hamburg, Spörex of St. Petersburg, &c. &c.

England had about twenty representatives, and France nine or ten. The names of two ladies were on the list of associates, and many others graced the galleries and side benches during the general meetings, and took seats at the festive board on the occasions of the three public dinners.

The first general meeting took place on the morning of the 18th, in the great room of the Kursaal. The proceedings were opened by the president, Dr. Fresenius, of Wiesbaden, in a brief address.

On Sunday, the 19th, a public excursion was made down the Rheingau—the railroad and steamboat being put at the disposition of the learned strangers gratuitously; and on two subsequent days *fêtes champêtres* were given in their honor by the towns-people, and by the Duke of Nassau, in the picturesque sites of the Nersberg and the Plattz.

The sectional sittings were on Monday, Wednesday and Thursday. The general meetings following Sunday, on Tuesday and Friday.

The sections on Geology, Botany and Zoology, transacted the most scientific business, the papers in those departments being numerous. Among the subjects brought forward in the chemical section, were "on animal fats," by Von Heintz; on the progress of chemical manufactures in Austria, by Seybel; on the carbonization of wood under water, by Schödler; on the employment of gas-burners in elementary analysis, by Prof. Hoffmann, &c.

Prof. Haidinger, of Vienna, and Prof. Nees Von Esenbeck, were among the most prominent speakers at the general meetings, the latter having delivered an address in honor of the 200th anniversary of the Leopold-Caroline Academy of Science.

The meeting adjourned to convene next year at Tübingen.

On a method of obtaining a perfect Vacuum in the Receiver of an Air Pump. By THOMAS ANDREWS, M. D., F. R. S. &c.—Mr. Andrews published a paper on the above subject in the Philosophical Magazine, which has been copied into the London Pharmaceutical Journal for January, 1853. The first part of this paper relates to the Torricellian Vacuum, which is deemed the most perfect that is capable of being made by art. It then details M. Regnault's method, which consists in providing a large glass globe, of $4\frac{1}{2}$ to $5\frac{1}{2}$ gallons capacity, placing in it a thin glass vessel containing 40 or 50 grammes of sulphuric acid and hermetically sealed, and then two or three grammes of water. He then exhausts the globe by the pump, until the water disappears, and the pump ceases to act, and closes the cock. The vessel of sulphuric acid is then ruptured by agitation, when it soon absorbs the aqueous vapor, which has previously driven out the greater part of the residual air by the action of the machine. The receiver of the air pump, in which the desired vacuum is to be produced, is then carefully connected with the exhausted globe; as perfect a vacuum as can be produced by the machine is then made, and the communication between the globe and receiver opened, when the small fraction of air in the receiver distributes itself equally in the two vessels, and is thereby reduced to a minute fraction in the receiver. A repetition of the action of the exhausted globe is necessary in the most accurate experiments. By this means M. Regnault reduced the mercurial column in the manometer to a small fraction of a millimetre. The following method Mr. Andrews proposes as affording a much more perfect vacuum, and with far less trouble to the operator:

"Into the receiver of an ordinary air pump, which it is not required to exhaust further than to 0.3 or even to 0.5 inch, but which must retain the exhaustion perfectly for any length of time, two open vessels are introduced, one of which may be conveniently placed above the other; the lower vessel containing concentrated sulphuric acid, the upper a thin layer of a solution of caustic potash, which has been recently concentrated by ebullition. The precise quantities of these liquids is not a matter of importance, provided they are so adjusted that the acid is capable of desiccating completely the potash solution without becoming itself notably diminished in strength, but at the same time does not expose so large a surface, as to convert the potash into a dry mass in less than five or six hours at the least. The pump is in the first place worked, till the air in the receiver has an elastic force of 0.3 or 0.4 inch, and the stop-cock below the plate is then closed. A communication is now established between the tube for admitting air below the valves and a gas holder containing carbonic acid, which has been carefully prepared so as to exclude the presence of atmospheric air. After all the air has been completely removed from the connecting tubes by alternately exhausting and admitting the carbonic acid, the stop-cock below the plate is opened, and the carbonic acid allowed to pass into the receiver. The exhaustion is again quickly performed to about the extent

of half an inch or less. If a very perfect vacuum is desired, this operation may be again repeated; and if extreme accuracy is required, it may be performed a third time. It is not likely that anything would be gained by carrying the process further. On leaving the apparatus to itself, the carbonic acid which has displaced the residual air is absorbed by the alkaline solution, and the aqueous vapor is afterwards removed by the sulphuric acid. The vacuum thus obtained is so perfect, that even after two operations it exercises no appreciable tension.

"To give a clear conception of the progress of the absorption, I will describe in detail one observation in which the tension was measured simultaneously by a good syphon-gauge and by a manometer, formed of a barometric tube 0.5 inch in diameter, inverted in the same reservoir of mercury as a similar tube communicating with the interior of the receiver. The barometer had been carefully filled, and the depression of the mercury estimated by the method already described at less than 1-100,000th of an inch.

"Previous to the admission of the carbonic acid, the exhaustion was carried only to 0.4 inch, it was again carried to 1 inch, and a third time to 0.5 inch, after which the apparatus was left to itself. The manometer indicated a pressure in—

15'	of 0.25 inch,
30'	" 0.17 "
80'	" 0.10 "
200'	" 0.02 "

In twelve hours the difference of level was just perceptible, when a perfectly level surface was brought down behind the tubes till the light was just excluded. In thirty-six hours not the slightest difference of level could be detected. The vacuum has remained without the slightest change for fourteen days.

It is evident that the only limit to the completeness of the vacuum obtained by this process, arises from the difficulty of preparing carbonic acid gas perfectly free from air. This may be very nearly overcome by adopting precautions which are well known to practical chemists. When an extreme exhaustion is required, the gas holder should be filled with recently boiled water, and the first portions of carbonic acid that are collected in it should be allowed to escape.

The substitution of phosphoric for sulphuric acid would remove the possibility of either aqueous or acid vapors being present even in the smallest amount, but such a refinement will rarely be found necessary.

In the experiment just described, the theoretical residue of air would be 1-135,000th part of the entire quantity in the receiver, which would cause a depression of 1-4500th of an inch. This result must have been nearly realized. If the exhaustion had been carried at each time to 0.2 inch, the residue by theory would have been only 1-3,375,000th part. But the experimental

results will not continue to keep pace with such small magnitudes.—*Lon. Pharm. Journ.*, from *Philosoph. Magazine*.

On the Action, and on the Method of preparing Cathartine.—TRENKLER prepares cathartine from the unripe green berries of *Rhamnus catharticus*. It resembles pure aloetina, both in a chemical and in a therapeutical point of view. One or two grains of cathartine in the form of pills usually produce one or two, or in a susceptible patient, three or four pulpy stools, without griping. Three grains form a large dose. If the first dose should fail to produce the desired effect, a second may be given in three or four hours. Dr. GRAFF (of Darmstadt), who has carefully studied its therapeutic action, employs it in torpor of the bowels, in hepatic and splenic congestions, hemorrhoids, dropsy, and gout.

By simply treating the inspissated juice of the unripe berries with alcohol and ether, we may obtain an impure cathartine in considerable quantity (oz. viij. from 12 lbs.), which acts very powerfully, and much like aloes.—*American Journal of Medical Science, Proc. Med. and Surg. Journ.*, Oct. 13, 1852. From *Jahrb. f. pr. Pharm.*, Jan., 1852.

Urea as a Diuretic.—Dr. T. H. TANNER states (*Med. Times and Gaz.* May 8, 1852), that he has employed urea as a diuretic and found it very efficient, and in no case has it given rise to any unpleasant symptoms. The ordinary dose, on being first used, is ten grains every six hours, dissolved in water flavored with syrup; as its effects decrease, the dose may be augmented to a scruple or more. At the same time, its action should be aided, as that of all diuretics should be, by the free administration of diluents, as well as by keeping the skin moderately cool.

In the first case in which Dr. T. used the urea, and the one in which he more particularly noted its effects, the quantity of urine secreted in the twenty-four hours previous to its administration was only fourteen ounces (high-colored, acid, sp. gr. 1018), whereas, in the succeeding twenty-four hours, during which three doses of ten grains each were administered, the secretion amounted to forty-four ounces (pale, acid, sp. gr. 1013). The remedy was continued for the ensuing nine days, in doses of ten grains every six hours, during which period the urine varied in quantity from forty-nine to thirty-eight ounces. At the end of this time it was discontinued, as the dropsy had been temporarily removed; and, on again having recourse to it three weeks subsequently, its effects were as satisfactory. *American Journ. Med. Science.*

Copahine Mège.—This is the name of a peculiar preparation of copaiba and cubebs proposed by M. JOSEAU, a French pharmacien in London, with which trials have lately been made in some of the London hospitals and in

private practice, and it is said (*Lancet*, Nov. 6, 1852) with very satisfactory results.

The peculiarity of M. Jozeau's saccharated capsules is stated to be that they are easy and agreeable to take, that they produce no nausea, sickness, or unpleasant purging, and that, when continued for a sufficient period, they cure gonorrhœa in a short time. Considering the insuperable dislike of some patients for copaiba, these, if verified by experience, are certainly most valuable improvements:

The following is the account given by M. Jozeau of the preparation of copahine mège, and the pathological facts which led to the peculiar manner of preparing this remedial agent:

It was noticed that such patients as were purged by the copaiba, evacuated per anum large quantities of this drug in an unaltered state, their urine not containing any of it. These persons, though sometimes cured, generally had a relapse. Those, however, who were not purged became well more slowly, and had no recurrence of the disease; their stools contained no copaiba, and their urine a great deal. From these facts it became evident that, in order to obtain regular and speedy effects, the copaiba should be made to undergo much modifications as to insure its more complete absorption into the system. Experiments were now instituted respecting the effects of the two principal substances contained in the copaiba—viz., the oil and the resin. These were separately tried. The oil produced a decidedly purgative effect; the resin purged less; but no complete cure was obtained by either substance taken separately.

It was now pretty clear that both the resin and essential oil were indispensable for obtaining curative effects, and the question arose how these could be modified so as to allow the stomach to digest them completely. This end was attained in surcharging the copaiba with oxygen, by means of nitric acid, the latter being added in proportions which varied according to the kind of copaiba acted upon. The nitric acid yields some of its oxygen to the essential oil, and the nitrogen is given off in the form of hyponitrous acid, by combining with the oxygen of the atmosphere. The copaiba thus treated is then well washed with water, until it no longer reddens litmus paper, and to it are added one tenth part of cubebs in fine powder, the same proportion of carbonate of soda, and one sixteenth part of calcined magnesia. The mixture is allowed to stand until it is quite solidified, and in that state it is made into small masses. The latter are then carefully covered with sugar, to which a pleasant pink color (*coccus cacti*) is given, and they then look like very pretty sugar plums.

To these saccharated capsules the name of copahine mège was given, because the experiments had been made conjointly by M. Jozeau and M. Mège, and the latter had first thought of making the saccharated capsules. For lymphatic patients and delicate females a second mass was prepared, into which, besides the above mentioned ingredients, some steel

was made to enter. This is then a sort of martial preparation of copaiba. The doses are stated as follows:

When there is neither pain nor inflammation, five saccharated capsules are taken three times per diem. One capsule more is then given with each dose every subsequent day, the doses being thus increased until purging is produced. Where there is pain or inflammation, these should first be treated by the surgeon in the manner he thinks the most advisable, and the copahine is to be commenced when acute symptoms have abated. It has been noticed that the martial capsules have effected a cure when the simple preparation has failed.—*American Journ. Med. Science*, Jan., 1853.

Chromic Acid as an Escharotic.—This acid is recommended by Dr. HELLER, a German physician, as a useful escharotic in severe cases, when properly and judiciously used. According to his experiments, all organic compounds are soluble in the readily deoxidizable chromic acid; the smaller animals, such as mice and birds, were so completely dissolved by chromic acid in the space of fifteen to twenty minutes, that no traces even of their bones, skin, hair, claws, or teeth could be discovered; so that it would appear that this metallic acid is not only both a safe and gradual escharotic, but furnishes us with another rapid and efficient solvent for organic animal matter.—*Annals of Pharm.*, June, 1852.

Results of Experimental Investigations on the Antidotal Properties of Nitrous Oxide. By GEO. J. ZEIGLER, M. D. [of Philad.] Dr. Zeigler after detailing at length the results of his experiments arrives at the following conclusions.

"Firstly, That nitrous oxide or protoxide of nitrogen is a powerful and direct arterial, nervous and cerebral stimulant.

Secondly, That it exerts a direct chemical influence on the blood, by supplying the essential elements for the arterialization of that fluid, and to a certain extent by inducing that process, thus producing in it similar changes to those effected by the atmospheric air, as proved by the effect on, and character of the re-established respiration.

Thirdly, That it is in these various modes antidotal to the effect of certain narcotizing agents.

Fourthly, That where vital excitability is not completely destroyed, this remedy has the power of sustaining and increasing it rapidly, and sufficiently to preserve life in numerous instances in which it would otherwise be destroyed.

Fifthly, That it will re-establish life-action even after all the usual evidences of its existence have failed, such as innervation, respiration and circulation; provided, firstly, that the muscular contractility, or vis insita of the heart and other tissues is not lost; secondly, that the blood has not coagulated or deteriorated to such an extent as to be insusceptible of arterialization and revivification; thirdly, that there is no organic lesion of any vital part

sufficient of itself to prevent recovery; and fourthly, that innervation is still susceptible of re-excitation.

In conclusion, I will state that in my last paper on the therapeutic applications of this agent in the form of surcharged liquid more especially, I inadvertently omitted to mention a peculiarity in its physiological action, which, however, might be anticipated from its influence over the contiguous renal apparatus, viz., its stimulant effect on the generative organs, thus operating as an aphrodisiac. This effect, like its diuretic, is not, however, constant or universal; yet, nevertheless, its application may prove useful in atonic states of this apparatus. With respect to its favorable therapeutic influences and applications, therein detailed, I have no reason to change my views, further experience and reflection only confirming still more strongly all former observations and impressions.—*Boston Med. and Sur. Jour.* Dec. 8th, 1852.

Leeches.—A correspondent of the New York Times, writing from Constantinople, gives the following information:

"It is not more than from forty to fifty years that leeches have been in extensive use for the abstraction of blood from the human body, and for many years the supply from the ponds of each country was sufficient for the wants of the population. But as the use of them increased, superseding so often the lancet and cupping, the leech traders turned their attention to procuring them from foreign countries. Twenty-five years since, all who could afford it in America used the "French" leech in preference to the American leech, because it would draw twice or thrice as much blood. But none the less a large portion of the leeches exported from France, have been brought thither from other countries on the Mediterranean.

"Leeches for Western Europe and America are now obtained from Morocco, Algiers and Tunis—from Hungary (which sends one year with another 120,000 pounds of leeches annually,) from Russia, and from Persia even. A trader brought, last winter, without hardly any loss by the perishing of the leeches, fifteen hundred pounds of leeches from the latter country. They froze solid as he was passing the lofty mountains, near Erzroom, but thawed into life again. The obstacle to bringing leeches from a great distance has been, that they were so liable to perish, and needed so much care and attention on the voyage. However great the loss and the consequent rise in price, there seems no limit to the price that the sick are willing to pay for them. Fifty cents is often paid for a single leech in our country towns. And in Peru, in South America, leeches (brought, perhaps, from Persia) have sold for three to five dollars a piece.

"The product of the leech fisheries in Turkey, is at present annually greater than that of any other country. One reason among others, for this result, is the want of cultivation, and the amount of undrained land in consequence on a sparsely inhabited country, and the facilities allowed to the Europeans who follow the business and have the protection of the local au-

thorities. The product of the last three years has been about 180,000 pounds annually, worth at the place of exportation eight dollars a pound, or \$1,440,000 each year. In a pound of small leeches there are from two hundred and fifty to four hundred leeches. A pound of large leeches contains half that proportion. There are probably from 50,000,000 to 60,000,000 of leeches annually exported from Turkey. They are sent chiefly to Trieste, Marseilles, and London, and some to America direct. The price varies greatly at these ports, according to the supply. The prices current of Marseilles as regularly include the price of leeches, as of wheat and wool."—*Boston Med. and Sur. Jour.*, Aug. 4th, 1852.

On Elastic Collodion. By M. E. LAURAS.—Having made collodion the subject of a special study, and the object which I sought having been attained, I now communicate the good results I have obtained by the *modus faciendi* which I employ.

The important improvement to be made in this compound, which hitherto has not been of very frequent application in therapeutics, consists in giving efficacy to it and in preventing the sufferings produced by its application on any portion of the body, and principally on the articulations, which are much constricted after having been covered with it, an effect due to its want of suppleness and elasticity, and which the skin requires both for stretching and contracting.

By adopting the following formula, every inconvenience is obviated, collodion becomes easy of employment, and enables the patient to move without suffering pain:—

Sulphuric acid of sp. gr. 1.847, 300 grms.; nitrate of potassa (very dry) 200 grms. Mix together in a stone-ware or porcelain pot, and add carded cotton, ten grms.

Leave in contact for twelve minutes; withdraw the cotton, wash it with cold water to remove the acid which it retains, and after two or three rinsings, immerse it in water containing thirty grms. of subcarbonate of potassa in solution in 1000 grms. of water; plunge it again into ordinary water, agitate well, and dry at a temperature of 77° to 86° F.

The cotton, thus prepared, takes the name of Xyloidine, and may afterwards be mixed with the ether and the other substances which form it into elastic collodion.

Elastic collodion. Xyloidine 8 grms.; ordinary sulphuric ether 125 grms. Place in a wide-mouthed flask, and add alcohol of sp. gr. .825, 8 grms. Agitate and then make a mixture composed of Venice turpentine 2 grms.; castor oil 2 grms.; white wax 2 grms.; sulphuric ether 6 grms. Heat together the first three substances, add the ether, and combine the two mixtures.—*Repertoire de Pharmacie* and the *Chemist*, from *London Pharm. Jour.*, Dec. 1st, 1852.

On the Preservation of Fruits and their Juices, by the application of Steam. By MAYET. The author has previously proved by a research, that the heat

of steam destroys the ferment in fruits, so that they may be preserved for a long time. To learn when this point has been reached, it is necessary to know how high the temperature rises in the fluid enclosed in the bottles when they stand shut up in a room, the atmosphere of which has been heated to 184° Fahr., and to learn the time requisite as well as the degree of heat which is necessary for the destruction of the ferment.

The results of his researches teach, that in no instances the fluid contents of the bottles which were placed in the steam room reached the temperature of their surrounding atmosphere, until they had stood, at the very least, an hour in it. In glass bottles, the influence of the heat was quicker than in stone ware.

From the commencement of the operation—that is, when the fire is first applied to the steam apparatus, nearly half an hour is required before the temperature of the steam room is reached by the contents of the bottles, when they hold about two pints and are made of glass. When made of stone, double that time is necessary. These results arise from each kind of vessel requiring a different quantity of heat to raise it to the temperature of the steam room; consequently the steam room does not arrive at a temperature of 184° with the same quantity of fire with each kind of vessel. When this temperature has been reached in the steam room, the contents of the glass bottles will be at 164°, and those of the stone ware ones at 86°.

Mayet's researches show that fruits and their juices do not require a temperature of 212° Fahr. to preserve them, and that 184° is sufficient to destroy their ferment, but that care must be taken to ascertain that the contents of the vessels have really reached this temperature.—*Annals of Pharmacy and Practical Chemistry, from Journal de Pharmacie.*

On the Growth of various kinds of Mould in Syrup.—Professor Balfour, the Professor of Botany in the University of Edinburgh, has read a valuable paper on this subject, at the Botanical Society in that city, in which he states that mould of various kinds, when placed in syrup, has a tendency to spread out, and form a flat, gelatinous and leathery expansion. This he shows by experiments as follows: Mould that had grown upon an apple was put into syrup; and in the course of two months there was formed upon the syrup a cellular, flat, expanded mass, while the syrup was converted into vinegar.

Mould that had grown upon a pear was also put into syrup, and the same result was produced. He also experimented in the same manner with various moulds that were growing upon bread, tea, and some other vegetable substances; the effect produced in most cases, was to cause a fermentation, resulting in the production of vinegar. In another experiment, a quantity of raw sugar, treacle and water were put into a jar, without any mould being introduced. When examined, after a lapse of four or five months, a growth like that of the vinegar plant was visible, and vinegar was formed. This plant was removed and put into fresh syrup, which was followed again by the production of vinegar. It appears

that, when purified white sugar only is used to make syrup, the plant, when placed in it, does not produce vinegar so speedily; the length of time required for the changes varying from four to six months. Dr. Balfour thinks this may possibly be owing to the presence of some ingredient in the raw sugar and treacle, which may tend to promote the production of vinegar. —*Annals of Pharmacy and Practical Chemistry.*

Editorial Department.

SALE OF POISONS BY DRUGGISTS, APOTHECARIES AND OTHERS IN THE UNITED STATES.—The Committee to whom the above subject was referred at the late Pharmaceutical Convention are desirous of getting all information on the subject they can obtain, and will feel under obligations for contributions to that end from Apothecaries, etc., residing anywhere within the United States. The special facts wanted are, 1st, whether any State or municipal law exists regulating the sale of poisons; 2d, if so, how it works; 3d, if not, does any voluntary conservative action have place among druggists and apothecaries, and if so, how far; 4th, to what extent do grocers and general shop-keepers retail arsenic and other poisons used for destroying animal life. Any such communications may be addressed to "W. Procter, Jr., Philadelphia," Chairman of that Committee, or to Messrs. Dr. Philbrick, of Boston, Alexander Duval, of Richmond, Va., or G. D. Coggeshall, of New York, and its other members.

DRUG INSPECTORSHIPS AND THE NEW ADMINISTRATION.—Rotation in Office has become one of the most prominent features of our National Government in its progress from Administration to Administration, and this too often without much regard to the public interests. Changes in many of the prominent and most lucrative officerships are frequently attended with small inconvenience, but it often has happened that the displacement of a clerk or inspector has thrown important duties into confusion. The effects of this policy have already been exhibited in the annals of the present government as regards the Inspectorship of Drugs. From the nature of the services required it is no easy matter to select well qualified persons. The association of the Chemical, Pharmaceutical, and Medical knowledge absolutely requisite to carry out the objects of the law, with the business qualifications proper to protect the pecuniary interest of the Government, when found in any Inspector of Drugs, especially when these are backed by experience in office, should prevent him from being displaced on party grounds. We hope the new Administration, if they determine to make any change, will at least consult the Colleges of Pharmacy of the several cities, in the appointment of the new officers.

LECTURES BEFORE THE MASSACHUSETTS COLLEGE OF PHARMACY.—We learn through the Boston Medical and Surgical Journal, that Dr. Charles T. Jackson has commenced a course of twelve lectures before that Institution. This

is gratifying information, as it indicates a determination upon the part of our Boston friends to advance in the right way. Pharmacutists established in business, who are willing to expend time and money to provide means of education for their assistants and apprentices, are disinterested advocates of professional advancement.

TO CORRESPONDENTS.—A Correspondent, K., asks the rationale of the action of the mixture known as "Twigg's Hair Dye" on the hair, and why it will dye some kinds of hair and not other kinds. An ingenious medical friend informs us that the reaction that takes place is between the oxide of lead in the acetate of lead, and the sulphur naturally existing in the hair, which results in the deposition of a layer of sulphuret of lead on and perhaps in the exterior layer of the hair. In cases where it does not act, he suggests that the sulphurous ingredient is absent, as is known to be the case in some specimens of hair. This seems to prove that the sulphur that enters Twigg's preparation is of no use, it only being active where sulphur exists in the hair to be acted on, and it is highly probable that the officinal solution of subacetate of lead, from its ready decomposition so as to yield oxide of lead, is much more appropriate and efficient for this use than the neutral acetate. The friend above quoted, considers that ammonia, associated with oxide of lead, increases its efficiency as a dye by virtue of its detergent action on the surface to be dyed.

AN IRISH OPINION OF PHILADELPHIA REFORMERS.—*The Dublin Medical Press* for Jan. 5th, 1853, contains the following letter addressed to its Editor, in relation to the joint Report of the Philadelphia County Medical Society, and the Philadelphia College of Pharmacy, published in our Journal for January 1852. We do not know whether the "Press" published the whole of the "Report" or not, but if it did, it is singular that the writer of the subjoined letter should have mistaken an attempt to correct existing evils in *one city and county*, for a general manifesto addressed to the physicians and apothecaries of the whole United States. The writer's hints as to the *mode* of reforming medico-pharmaceutical practice in this country are rather amusing, especially that about appointing committees of inquiry.

To the Editor of the Medical Press.

SIR,—In your paper of the 8th of December, you give a code of "Pharmaceutical Ethics," framed by the Medical Society and College of Pharmacy of Philadelphia, U. S." and you commend its "candid and patient consideration to the Dublin practitioners in this line." Now, sir, my object in writing to you is to show the Philadelphia faculty, who, as a matter of course, read the MEDICAL PRESS, that your recommendation of their code of laws will never be attended to as long as the present system of gross neglect, with regard to professional acquirement and legitimacy, exists within the States; because there is no man could respect the laws of a body who allow Tom, Jack, and Jerry to practise physic and pharmacy in their country; never taking the trouble of inquiring whether he is a tinker or a tailor, but permitting him to practise, to the loss and detriment both of the legitimate practitioner and the public. This is too well known a fact to admit of even the least denial. I am myself cognizant of such a case at

present in the city of St. Louis, Missouri, where a man, who was brought up to honest business in this good city of Dublin, went to St. Louis, and having the audacity to write Doctor before his name, is now nearly twelve months in practice as an apothecary and doctor, though he never lost one hour in the attainment of medical or pharmaceutical knowledge; and here is this impostor making his fortune, while men who have wasted years of toil and some hundreds of pounds before they could obtain a degree, are not able to get a crust in the same city. Now, sir, if a proper law was instituted by the legislature, I ask you would this be the case? If the Colleges of Philadelphia had a branch committee in every city and town in the States, whose duty should be to go around annually and demand the diploma of every person calling himself a doctor, surgeon, or apothecary, and practising as such—if such an arrangement was, I ask you would this state of things continue? By taking the names and dates of the several diplomas exhibited, they could communicate with the colleges at home, and soon discover whether the holder of each diploma was its original possessor: thus would the chaff be separated from the wheat, and while the legal practitioner would be thus protected, the culprit, when exposed, would be greatly benefited by a three months' dance upon the treadmill, or twelve months solitary confinement; with a caution that if caught so offending again, the full rigor of the law would be brought to bear upon him.

To each sub-committee, some little trouble in the carrying out of the foregoing arrangement may be given for the first year, but there it would cease, for every year after it would be only the diploma of those who had commenced practice since the previous examination that they would have to inspect, and by men who love their profession as a noble and an honorable one, this task would be cheerfully performed; and believe me, all quacks and impostors, glorying in stolen or borrowed imaginary plumage, would very soon sink into their former insignificance.

When the Philadelphia colleges act thus for the safety and honor of their profession, then will their brethren at this side of the Atlantic read with pleasure every paper and advice emanating from them, and America will bless the day that they came forward to save her children from being butchered and poisoned by those despicable wretches—their self-made M. D.'s and apothecaries of her Western States. I am, sir, yours,

A SUFFERER BY QUACKERY.

Report to Congress of a select Committee on the claims of William T. G. Morton, M. D., as the discoverer of the anæsthetic power of Sulphuric Ether when inhaled. By Dr. WILLIAM H. BISSELL, of Illinois, Chairman. Congressional Document, pp. 120.

Dr. Bissell's Report awards the merit of the discovery of the anæsthetic properties of Ether to Dr. Morton, in the following language:

Upon a full examination of the whole case, so far as time and means were afforded to your committee, they have come to the conclusion—

1st. That Dr. Horace Wells did not make any discovery of the anæsthetic properties of the vapor of sulphuric ether, which he himself considered reliable, and which he thought proper to give to the world. That his experiments were confined to nitrous oxide, but did not show it to be an efficient and reliable anæsthetic agent, proper to be used in surgical operations and in obstetrical cases.

For the rest, your Committee have come to the same conclusions that were arrived at by the Trustees of the Massachusetts General Hospital at their meeting in January, 1848, and reconsidered and confirmed in 1849, and adopted by the former Committee of the House, viz:

2nd. That Dr. Jackson does not appear at any time to have made any discovery, in regard to ether, which was not in print in Great Britain some years before.

3d. That Dr. Morton, in 1846, discovered the facts, before unknown, that ether would prevent the pain of surgical operations; and that it might be given in sufficient quantity to effect this purpose, without danger to life. He first established these facts by numerous operations on teeth, and afterwards induced the surgeons of the hospital to demonstrate its general applicability and importance in capital operations.

4th. That Dr. Jackson appears to have had the belief that a power in ether to prevent pain in dental operations would be discovered. He advised various persons to attempt the discovery. But neither they nor he took any measures to that end; and the world remained in entire ignorance of both the power and safety of ether, until Dr. Morton made his experiments.

5th. That the whole agency of Dr. Jackson in the matter appears to consist only in his having made certain suggestions, which aided Dr. Morton to make the discovery—a discovery which had for some time been the object of his labors and researches.

The Southern Journal of the Medical and Physical Sciences. Edited by Doctors J. W. KING, WILLIAM P. JONES, R. O. CURRY, and B. WOOD. Vol. 1. No 1. Jan. 1853. Nashville, Tenn.

With our January exchanges came a new medical journal under the above caption and direction, bi-monthly in its issue, and each number containing about 72 pages. The general appearance and typography of the book is good. The work is divided into three departments, viz: Practical Medicine and Surgery, Chemistry and Pharmacy, and Dental Surgery, and addresses itself to the Physician, the Apothecary and the Dentist. The latter is rather a new feature, though, no doubt, one that will prove advantageous to the publishers, as it extends the field of subscribers. The contents of the Chemical and Pharmaceutical department in the initial number, indicate a disposition to give more importance to those collaterals of medicine, than ordinary medical journals, and if sustained by contributions from the intelligent of the Apothecaries, may prove a useful agent in spreading correct views of the ethics and practice of Pharmacy in the Great South West. Success to the effort.

Materia Medica, or Pharmacology and Therapeutics. By WM. TULLY, M. D. Springfield, Mass.

We have received the 2d and 3d numbers of this work for December and January, which do not finish the introductory chapter. The originality of the author's mode of treating his subject is very manifest, and indicates that he has devoted to it much thought and time. As we remarked in a former notice, Dr. Tully is inclined to employ a peculiar nomenclature, which, though natural to himself by long adoption, gives an air of pedantry to his composition, however unintentional it may be. For instance, a few short sentences will explain—"It has long appeared to me that the medicinal operation of this pure Alcaloid Quinine, is more pleasant, agreeable and kind than that of the Disulphate of Oxyd of Quininum." "The crude, in-

spissated, descending sap of *Papaver somniferum*, commonly called Opium, requires," &c. "None of the medicinal powers, operations or effects, either of Morphine or Oxyd of Morphinium, seem to depend," &c. "To this I doubt not that the Iodo-quininate of Iodide of Potassium," &c., &c. These extracts are merely made to illustrate the great latitude Dr. Tully assumes in dealing in nomenclature, apart from his views on the several subjects treated, which, when the first part of the work has been completed, we will endeavor to notice, as they deserve more time and space than our limits and leisure will now permit.

A Discourse on the times, character and writings of Hippocrates, read before the Trustees, Faculty and Medical Class of the College of Physicians and Surgeons, at the opening of the term 1852-3. By ELISHA BARTLETT, M. D., Prof. Materia Medica, &c. New York, 1852.

Introductory lectures too often prove a bore to the audience who are condemned to listen, because a tale too often told loses its interest, and lecturers are prone to hedge in the limits of their discourses by the well defined lines of their specialities. Occasionally, breaking through this time-sanctioned custom, the preliminary hour of "a course" is rendered a season of intellectual pleasure; the speaker enlists the attention of his hearers, and together they proceed to gather flowers in the fields of learning to visit the men and scenes of ancient story, and to contemplate the life-histories of men celebrated in building up medical science. To this class belongs the "Discourse" of Dr. Bartlett, and, despite its inordinate length, we doubt not it was listened to with continued interest.

Notice of the Life and Professional services of WILLIAM R. GRANT, M. D. A discourse at the opening of the lectures in the Medical Department of Pennsylvania College for the session 1852 & 53. By HENRY S. PATTERSON, M. D., Professor of Materia Medica and Therapeutics.

The character of the late Professor Grant, is eloquently depicted by his colleague, as full of earnestness in the pursuit of his profession, and of seriousness in the business of life. Conscientious in the discharge of his duty to his class, his patients, his brethren, and to his inner self, he was ready, when death approached, to leave the scene of his mortal career with the confidence and hopefulness incident to a well-spent life.

Physicians' Visiting List, Diary, and Book of Engagements for 1853. Philadelphia, Lindsay & Blakiston.

A year's experience has proved the usefulness of this little unpretending annual, and won for it the favorable opinion of many practitioners.

DR. BUCHNER, SR., the learned Pharmaceutist and distinguished Journalist of Bavaria, died on the 6th of June last, in the 70th year of his age. Dr. Buchner was born at Munich, on the 6th of April, 1783. He commenced the apothecary business in 1803 with Ostermaier, and continued it

with the celebrated Trommsdorf of Erfurt, during which service, in 1807, he took the degree of Doctor in Philosophy, at the University of Erfurt. In 1814 Dr. Buchner was engaged in the formation of the Pharmaceutical Society of Bavaria, and was its first Secretary. He commenced the publication of his *Repertorium für die Pharmacie* in 1815, so well known for its scientific character, and which embraced more than 100 volumes at his death. In 1818 he was appointed Professor of Pharmacy and Toxicology in the University of Landshut, and subsequently, in 1822, received the degree of M. D. After the University of Landshut was transferred to Munich, in 1826, the pharmaceutical class increased so as to be second only to that of Berlin. Dr. Buchner belonged to many learned societies, and was knighted by the King of Bavaria in 1848. From 1849 to his death he was actively engaged as the President of the Commission appointed by the King to revise the PHARMACOPEIA BAVARICA, a work in which he took deep interest. The following paragraph from Dr. Pettenkoffer's address on the occasion of his burial, is a noble testimony to the merit and standing of his departed friend:

It was a long road from the gardener's boy to the dignity of rector magnificus of one of the first universities in Germany, which our lamented friend and brother had to pass; the road was so difficult that his energies must have been uncommon not to have succumbed before reaching the goal. Dr. Buchner was no hot-house plant, that required anxious nursing—he was made for the rough soil of life, whose varying heat and cold, drought and moisture, he experienced, blooming and bearing fruit. Dr. Buchner belonged to the number of those men whose zeal is not to be enhanced by praise and flattery, by the vile allurements of ambition, nor to be slackened by unmerited criticism and indifference. After having once chosen a certain profession, that of Pharmaceutist, he was to the end of his active life prompted in all his movements by one single idea—by the idea of ennobling the trade of the Pharmaceutist on strictly scientific foundations. This object he had before him when he went to Trommsdorff, at Erfurt; with this view he visited the hospitals at Munich, where he not only dispensed medicines, but also watched their effect upon the patient; this same idea urged him to the earnest study of Chemistry, as the principal foundation of technical Pharmacy, which gave him strength to continue his voluminous *Repertorium für Pharmacie*—it was this idea which induced him to accept the pharmaceutical professorships at Landshut and Munich, and which guided him in all his labors relating to the art of the Pharmaceutist. Long before his death he had reached the goal as victor, and many a laurel crowned his modest brow. Not only did the Academy of Sciences at Munich elect him as its member, but many foreign academies and learned societies did the same. He filled at our university several times the office of Dean of the Medical Faculty, and was, as has been already mentioned, in the year 1842-43 Rector Magnificus. His pupils loved and esteemed him in an uncommon degree, and not only the Pharmaceutists of his native country, but also those abroad, considered him as their chief. When, in 1843, Dr. Buchner visited Vienna, he was welcomed on board the steamer by all the Pharmaceutists of that capital, who vied with one another in making for him each day of his residence there a feast.—*London Pharm. Journ.*, from *Buchner's Neues Repertorium*.

Dr. PEREIRA.—By the last steamer we are informed of the death of this distinguished physician, lecturer and writer, in London, at the age of 49 years, in the midst of his untiring and useful labors.